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COMPUTERWORLD

FTC probe won't tame Microsoft

Execs pledge to remain 'aggressive' in market

BY PATRICIA KEEFE
CW STAFF

REDMOND, Wash. — Competitors who envision a "kinder, gentler" Microsoft Corp. emerging from the aftermath of a government antitrust probe will be sorely disappointed, according to company President Michael Hallman.

Microsoft confirmed two weeks ago that the Federal Trade Commission is investigating a November 1989 press release in which Microsoft and IBM defined what Windows would and would not do [CW, March 18].

"We will not back away from our commitment to the industry and the business or from being a very aggressive company. We are not trying to win a popularity contest," Hallman said. Instead, according to Hallman, Microsoft

Continued on page 6

Outlook turns bleak as IBM profits slip

BY NELL MARGOLIS
CW STAFF

As IBM goes, so goes the computer industry, analysts agreed last week. They also concluded that the announcement of dismal profit prospects for 1991 by the largest computer company means bad news for other firms.

IBM's first-quarter profit is likely to be 50% below analysts' expectations on flat revenue, IBM said last week. Revenue is likely to remain flat throughout 1991, and profits, once estimated at a 5% gain for the year, will probably decline.

The falloff will hit "across all product lines and across all geographies," IBM spokesman Peter Thonis said. It reflects no product or corporate problems, he added, but results from customer reluctance to spend during economic hard times.

Many analysts took IBM at its word that problems stemmed from external economic factors such as the recession and the Persian Gulf war.

"IBM isn't telling us anything we didn't know or shouldn't have known last December," said Paine Webber, Inc. analyst Robert Therrien.

Peter Labe, an analyst at Labe, Simpson, Inc., agreed. "We're in the middle of a worldwide recession; IBM is in the middle of a difficult high-end transition," he said. "What did people expect?"

High expectations

With Wall Street projections so far off the mark, Therrien and others indicated, the investment community apparently expected that IBM would be able to marshal its technological, financial and corporate resources to make an end run around worldwide economic disorder.

Last week, IBM indicated it could not. That news contributed to a 60-point drop in the Dow Jones industrial average last Tuesday, as investors appeared

Continued on page 8

One reason: IS budgets feeling pinch

BY CLINTON WILDER
CW STAFF

When the lease on Corning, Inc.'s IBM 3084 mainframe expired last year, one might have expected the $3 billion manufacturing firm to upgrade. Instead, it renewed the 3084's lease at a lower rate, in accordance with a three-year corporate policy to hold information systems spending flat, according to Harvey Shrednick, vice president of information services.

Corning is typical of scores of large U.S. corporations whose IS departments are consolidating, downsizing applications to smaller platforms and generally doing more with less.

Last week, IBM's lower revised earnings projections served notice that its bottom line and those of other vendors are feeling the squeeze of those tighter IS budgets.

"IBM has been banking on companies like us buying new mainframes, and we're not,"

Continued on page 8

Projected increases in IS budget	1990	1990	1991
Index Group (394 companies surveyed)	7.5%	6.9%	5.3%
Deloitte & Touche (614 companies surveyed)	NA	8.0%	5.0%
Gartner Group (200 companies surveyed)	5.8%*	5.0%*	4.7%
International Data Corp. (1,850 companies surveyed)	6.7	7.3	6.0

*Actual

CW Chart: Tom Monahan

Banyan set to ensnare OS/2 in Vines

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — A version of the Banyan Systems, Inc. Virtual Networking System network operating system that will support OS/2 clients is "imminent," according to the networking vendor.

Industry analysts predicted that Vines Version 4.1 — currently in beta testing — will be unveiled at next month's Association of Banyan Users International conference in Toronto.

OS/2 will soon join MS-DOS and Microsoft Corp.'s Windows clients in their ability to be centrally added or deleted anywhere across multiple interconnected Vines networks without requiring manual updates to servers.

Computers running OS/2 will also participate in Banyan's Streettalk global naming service, which allows a user anywhere on a Vines network to communicate directly with other computers without having to know their location and specify access routes to them.

The OS/2 support is critical to

Continued on page 96

Amdahl eyes AD/Cycle turf

BY ROSEMARY HAMILTON
CW STAFF

Amdahl Corp., the longtime IBM mainframe competitor, is about to go after another market dear to IBM's heart: applications development.

Industry analysts said they expect Amdahl to unveil a highly automated mainframe-based development platform that will include a database management system, a high-level language and a code generator. An Amdahl spokesman confirmed that a major software announcement will take place tomorrow but would not provide details.

The company said it will also announce tomorrow an extension of its current product line, which analysts and users said is likely to be the long-expected IBM 3390-compatible disk drive. Hitachi Data Systems Corp., the other IBM mainframe competitor, has had its 3390-like disk drive on the market for several months.

The Bank of Montreal confirmed that it had tested an Amdahl systems development facility code-named Huron two years ago but discontinued it

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Most productive

Users of Realia's PC-based Cobol compiler give it the highest score in ability to increase programmer productivity

See Buyers' Scorecard page 70

Product	Score*
Realia's Realia-Cobol	73
Microfocus' Microfocus-Cobol	71
Liant's RM-Cobol	60

*Scores are based on product ratings combined with importance assigned to each criterion

CW Chart: Doreen St. John

INSIDE

Chip Henderson

The CEO View features Wrangler's Mackey J. McDonald, a strong believer in the power of information to transform manufacturing processes. Page 59.

Rock of Gibraltar? We'll find out next month if the coalition of DEC, Compaq, Mips and others will sink or swim. Page 4.

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8 A Washington, D.C.-based coalition of university, industry and labor leaders is concerned that the U.S. is losing its technological edge over competing countries.

10 Microsoft and 3Com are cooking up a recipe that blends 3Server with LAN Manager to fulfill an earlier promise of support.

12 A new precedent may be set if incriminating electronic mail messages sent among three Los Angeles police officers accused of beating a motorist are used as evidence in court.

16 An ambiguous U.S. Treasury Department study pleases both Adapso and advocates of repealing Section 1706 of the Tax Reform Act of 1986.

95 Two operating systems are better than one was Stratus' apparent motto as it unveiled the industry's first RISC-based fault-tolerant computer.

Quotable

"We will not back away from our commitment to the industry and the business or from being a very aggressive company. We are not trying to win a popularity contest."

MICHAEL HALLMAN
MICROSOFT

On FTC antitrust probe of Microsoft Corp. activities. See story page 1.

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The 5th Wave

"I'M SORRY, BUT MR. HALLORAN IS BEING CHASED BY SIX MIDGETS WITH POISON BOOMERANGS THROUGH A MAZE IN THE DUNGEON OF A CASTLE. IF HE FINDS HIS WAY OUT AND GETS PAST THE MINOTAUR, HE'LL CALL YOU RIGHT BACK; OTHERWISE TRY AGAIN THURSDAY."

EXECUTIVE BRIEFING

■ **Clamps on corporate information systems spending** bode ill for IBM and other systems vendors, possibly for the entire year. Overall spending growth is predicted at just 5%, and at many major corporations, including Manufacturers Hanover Trust and Corning, IS spending is flat or below last year's levels. IBM warns analysts that earnings will be well below earlier projections, and other vendors are expected to follow suit. **Stories, page 1.**

■ **Amdahl will launch a software challenge to IBM.** The longtime mainframe rival is expected to unveil an alternative to IBM's AD/Cycle this week, including a database management system and a high-level language and code generator. AD/Cycle customers say they are open to hearing the pitch from Amdahl for the new software offering, code-named Huron. **Page 1.**

■ **Wrangler CEO Mackey J. McDonald** is a firm believer in using IS to enable change in the apparel industry. But McDonald says he feels the industry is still behind where it should be in IS implementation. **Page 59.**

■ **A defiant Microsoft** says it won't back down from aggressively competing and setting standards in the wake of the recently revealed FTC investigation. **Page 1.**

■ **IBM is accused of violating the Consent Decree** by one of its outsourcing competitors. Dallas-based ACS says IBM has re-entered the service bureau business in violation of the 1956 U.S. Department of Justice decree. **Page 6.**

■ **E-mail messages among Los Angeles police officers** can be used as evidence in a current brutality case, legal experts say. The officers sent messages from cruiser-based mobile data terminals on the night a motorist was allegedly beaten by police. **Page 12.**

■ **The debate over outsourcing of network management** rages on. While some users try to draw the line between outsourcing tactical pieces and keeping strategic ones, others push for an all-or-nothing approach. **Page 51.**

■ **Scientific computing is gaining wider acceptance** for commercial applications. Firms such as Monsanto, Dow Chemical and the regional Bell operating companies are looking to big number-crunchers to cut product development costs and tie into corporate networks. **Page 27.**

■ **Outsourcing at Southland** is a good news/bad news scenario. The retail operator realizes cost savings but has had to smooth over some rough spots regarding control, priorities and disaster recovery capability. **Page 61.**

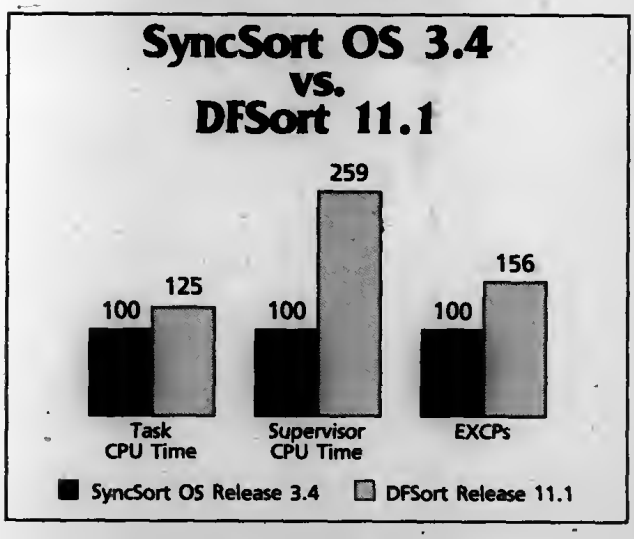
■ **Exposure to foreign cultures** can be a great advantage for IS professionals. Resumes that mention overseas work experience "are being pushed to the top of the pile," one headhunter says. **Page 81.**

■ **Software maintenance is finally getting the respect** it deserves. Attention is being given to code analysis, restructuring and reverse-engineering tools to help overwhelmed IS groups get control over systems and move them to new platforms. **Page 65.**

■ **User companies selling IS services commercially** rate the overall experience positively — but advise treading carefully. **Page 73.**

■ **On-site this week:** Macintosh, OS/2 or Windows? That's the burning question facing NBC TV Stations, which is trying to decide which PC standard offers the optimum mix of user-friendliness and networking capability. **Page 41.** Louisville Gas & Electric uses a mainframe-based hazardous waste tracking system to ensure compliance with federal EPA and OSHA requirements. **Page 31.**

THE BEST KEEPS GETTING BETTER.



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Allies to produce RISC low end

Gibraltar Group consortium may try hand at laptops, data centers next

BY MARYFRAN JOHNSON
CW STAFF

The fiercely competitive Unix desktop market will get another jolt early next month when a computer industry coalition known as Gibraltar Group reveals its plans to produce a low-end, inexpensive workstation based on reduced instruction set computing (RISC).

Guiding light

Sales of Sparc-based systems – dominated by Sun – have chewed up the lion's share of the RISC market

Source: International Data Corp

The potential market for the machine is vast, encompassing the customer base of the new allies: Digital Equipment Corp., Compaq Computer Corp., Mips Computer Systems, Inc., Microsoft Corp. and The Santa Cruz Operation (SCO).

"We are not establishing any new standards, only specifications for a particular platform," said an official at one of the firms, who spoke on the condition be not be identified. "We will produce a RISC workstation first, but the potential is here to move upward to the data center and downward to laptops."

Industry standard specs

The "reference platform" produced by the alliance — which sources said will assume a name other than Gibraltar Group when it goes public in a few weeks — will be a set of hardware and software specifications complying with established or de facto industry standards.

The machine will house an Extended Industry Standard Architecture bus, DEC's Turbo Channel bus and eventually Future Bus Plus, an emerging industry standard.

Sources close to and within the firms in the alliance last week confirmed several elements of the upcoming announcement, including the following:

- Microsoft and SCO will provide the shrink-wrapped software so crucial to the success of the initiative.
- SCO will eventually package and distribute the Open Software Foundation's (OSF) OSF/1, but other operating systems will be offered as well, particularly Microsoft's OS/2 follow-on, New Technology or Portable OS/2.

Offering multiple operating systems to work with the new standard — rather than forcing everyone to adopt OSF/1, for example — is considered a key attraction for customers.

- Mips' RISC chip is the chosen microprocessor architecture, ensuring it a spot as the fourth RISC chip alternative to Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc), Motorola, Inc.'s 88000 and Intel Corp.'s I486 and expected I586.

Analysts said they see this machine, which is at least two years from availability, as a challenger to low-end workstations from Sun, Hewlett-Packard Co.'s Apollo division and eventually IBM as well.

"They're choosing the Mips chip for three reasons," said David Card, a Unix analyst at International Data Corp. (IDC) in Framingham, Mass. "DEC uses it already. It's not Sparc. And Microsoft is developing New Technology [Portable OS/2] on it."

David Ditzel, director of advanced development at Sun, said he tried to sell Sparc to Compaq and failed. He claimed it would take two years to develop a system based on the expected specifications.

From DEC's point of view, enhancing the market for the Mips RISC chip could boost the prominence of its own Decstation line, said Peter Burris, an IDC analyst. "Compaq could help it do that, and Compaq desperately needs access to software expertise with some solid partners it can count on."

DEC said it will continue to fully support its own Unix workstation strategy based on the Mips chip and OSF/1 operating system.

OFFERING MULTIPLE OPERATING systems to work with the new standard — rather than forcing everyone to adopt OSF/1 — is considered a key attraction.

While each company in the alliance has much to gain against workstation competitors Sun, HP and IBM, users will ultimately be the biggest winners of all, industry analysts agreed.

"More choices. More competitive technologies. I can't see how users could possibly lose," said Sandra Gant, an analyst at Gartner Group/Infocorp in Cupertino, Calif.

Yet there are substantial technical challenges ahead in any attempt to establish binary compatibility between applications written for Unix or OS/2, Card noted. "Binary compatibility is what you need for shrink-wrapped software if you're going to run the software in different implementations of the same chip architecture and operating system," Card said.

Senior Writer Richard Pastore and West Coast Senior Correspondent J. A. Savage contributed to this report.

SPA fights ignorance of software piracy laws

BY JAMES DALY
CW STAFF

SAN FRANCISCO — The Software Publishers Association (SPA) stepped up its efforts last week to end illegal copying of software with a renewed public awareness campaign designed to eradicate the rampant piracy it said costs the software industry up to $7 billion annually.

"Many people who copy software don't even know they are breaking the law," Executive Director Ken Wasch said at the Washington, D.C.-based group's four-day symposium.

The simplicity of software piracy, however, creates a daunting challenge to developers. Most personal computer users can copy a $500 program onto a $2 disk in just a few seconds. "We're the only industry that empowers every customer to become a manufacturing subsidiary," Wasch added.

SPA members said an early objective is to make users aware of the many forms of piracy, including unauthorized duplication, downloading copyrighted software from electronic bulletin boards, dealers loading free software onto hard disks to sweeten a sale and counterfeiting. "This is fundamentally a policy of education," Symantec Corp. President Gordon Eubanks said.

How big is the problem?

By comparing actual software sales with the number of purchases each PC sale is expected to generate, the SPA estimated that nearly half of the software running on PCs in the U.S. is pirated.

That figure leaped to 80% in Germany, while in South Korea, the group calculated that an incredible 98% of the software is illegal. "Software pirates are our No. 1 competitor," said Tom Lemberg, chief counsel at Lotus Development Corp.

The SPA also announced the new Copyright Protection Fund, which will be used primarily to explain the legalities of copying software and to finance legal action.

Several companies have already contributed $15,000 to $30,000 each to the fund.

Pirates' booty

Software vendors claim that unauthorized duplication is a multibillion dollar problem

PC software industry revenue 1990	
Worldwide	$10.2 billion
U.S.	$4.6 billion

Additional revenue lost annually to software pirates	
Worldwide	$6 billion-$7 billion
U.S.	$2 billion

Source: Software Publishers Association
CW Chart: Doreen St. John

The cost of piracy is ultimately borne by the licensed user, who suffers when software companies have less funds to spend on further product development.

Wasch said the SPA receives about 10 calls daily on its toll-free piracy hot line and has filed more than 70 lawsuits against software pirates.

The group has also distributed more than 10,000 copies of its self-audit kit, which allows companies to ferret out illegal copies of software.

CORRECTIONS

The Product Spotlight on project management software [CW, March 11] incorrectly attributed Project Software & Development, Inc.'s Project/2, a mainframe software package, to Primavera Systems, Inc. Primavera is a vendor of personal computer-based products.

Kevin Morrow, research analyst at The Ohio Co. in Columbus, Ohio, was referred to as simply "Morrow" in a March 11 story.

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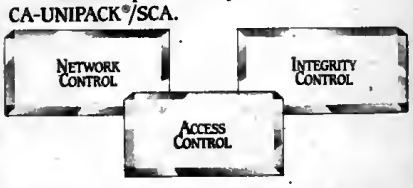

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NEWS SHORTS

Sage, Index finalize merger

The merger of Sage Software, Inc. and Index Technology Corp. became official last week as stockholders of both companies approved the action. The combined companies will have a user base of approximately 10,000 users, Sage said. Both sell software in the computer-aided software engineering market.

Group studies phone access to data

The North American Telecommunications Association (NATA), based in Washington, D.C., formed a task force last week to speed the development of software interfaces between telephone systems and computer databases. For example, users want to automatically link incoming calls with customer records, but there is little generic software for such applications, NATA said. The first meeting of the NATA Computer-Telephone Interface Task Force, set for April 18 in Arlington, Va., will include representatives from IBM, Digital Equipment Corp., Hewlett-Packard Co., Bellcore and others.

Derailment cuts long-distance cable

A train derailment in Pt. Conception, Calif., last Tuesday caused delays for AT&T and MCI Communications Corp. telephone customers as calls were rerouted. The train severed a fiber-optic cable, tying up circuits throughout the peak workday calling hours. MCI said 500,000 calls coming in and leaving Northern California, Oregon and Washington were delayed.

Retirees sue IBM over benefits

A group of 200 retirees brought a class-action suit against IBM last week, charging that they, along with about 300 other former employees, were given benefits that were inferior to those subsequently offered a second group of employees. The plaintiffs took early retirement from IBM's Lexington, Ky., plant from 1989 to early 1990 and were given one year's salary as severance pay. When IBM sold the plant to Clayton-Dubilier in August 1990, it paid two years' salary plus $25,000.

Sprint to expand European service

Belgium's telecommunications authority announced agreements last week to jointly provide a series of international services with U.S. Sprint Communications Co. The carriers will interconnect their respective virtual private network services and their CCITT X.400-compatible electronic mail services. Under a one-stop shopping arrangement, international customers can ask either carrier to set up dedicated lines in both countries.

Senate to consider easing Bell limits

The Senate Commerce Committee voted 18 to 1 to allow the regional Bell telephone companies to manufacture telecommunications equipment, one of several activities barred by the decree that broke up the Bell System. The full Senate must vote on the measure, and the House of Representatives is likely to introduce similar legislation. The Senate panel, the White House and the Baby Bells argued that lifting the ban will lead to product innovation and help U.S. competitiveness. AT&T and consumer groups said it will invite unfair competitive practices leading to higher prices.

Unisys weather contract in doubt

A Department of Commerce official testifying before a congressional subcommittee last week admitted that the U.S. is "seriously contemplating" terminating its contract with Unisys Defense Systems for Nexrad, a computer-enhanced weather radar system. Gray Castle, a deputy undersecretary of commerce, said Unisys may default on its requirements to provide working software for Nexrad, which Weather Service officials say is at least $59 million over budget and as much as two years behind schedule.

More shorts on page 96

Competitor: IBM bucks decree

BY CLINTON WILDER
CW STAFF

DALLAS — Darwin Deason's stated philosophy is: "Good things come to those who are patient, but normally it's the leftovers from those who hustle." Now, an impatient Deason is trying to hustle IBM back before the U.S. Department of Justice because of IBM's entry into the outsourcing business.

Deason, chairman of Affiliated Computer Systems, Inc., will meet with representatives of several other outsourcing vendors here today to discuss what he alleges are violations of the 1956 Consent Decree between IBM and the Department of Justice. Deason contends that IBM's selling of remote processing services violates the decree's prohibition of IBM participating in what was then called the service bureau business.

"It's now called outsourcing, but it's the same thing," Deason said. "We think it's crystal clear that they are in violation." He also accused IBM of pricing outsourcing services below cost in order to win big contracts.

Deason said he believes IBM is in violation on deals in which it processes a customer's data remotely, such as serving New Orleans-based Hibernia Corp. from IBM's data center in Denver. On-site facilities management, like that performed by IBM at Eastman Kodak Co., is not a violation in Deason's opinion, although he is planning to ask the Justice Department for "an expanded version" of the Consent Decree to cover facilities management.

What the decree says

The decree defines service bureau business as "the preparation with tabulating and/or electronic data processing machines of accounting, statistical and mathematical information and reports for others on a fee basis." The decree required IBM to transfer all of its service bureau contracts to an independent subsidiary, Service Bureau Corp., which it later sold to Control Data Corp.

IBM's denial

An IBM spokesman denied that IBM's outsourcing services violate the decree. "That is absolutely incorrect," spokesman John Clark said. "Our service offerings comply with the terms of the Consent Decree. IBM is not in the service bureau business." He declined to elaborate.

Of the six companies that had agreed last week to attend the meeting, four are based here: Power Computing, Inc., Kimberly-Clark Computer Services, Lomas Information Systems and Information Network Corp.

Others accepting the invitation were Systematics, Inc. in Little Rock, Ark., and Wayne, Pa.-based Sungard Data Systems, Inc.

FTC

FROM PAGE 1

concentrates on creating vision, innovation and standards, which he said is the proper definition of market leadership.

Still, both Hallman and Jeff Raikes, vice president of office systems, agreed that Microsoft needs to continue with, and perhaps enhance, what they said is a long-standing policy of maintaining a "broad dialogue" with people who have problems either with what the company does or how it does it. "Given the level of intensity [of criticisms], are we doing more than we would ordinarily do? Yes," Hallman said.

Hallman: *Microsoft will stand tough, play fair*

Both executives repeatedly emphasized Microsoft's willingness to "communicate our strategy to anyone who will listen" and, in return, to be open to any suggestions for improvement.

"We've made some mistakes," Raikes acknowledged, adding that the company needs to learn from them. He tracked down several developers at a recent industry gathering specifically to address their complaints.

Hallman and Raikes repeatedly labeled many of the accusations leveled against Microsoft by competitors as "absurd." They denied that Microsoft is overly competitive in its dealings, as some have alleged.

"What is so bizarre about this is that the whole concept of a free enterprise system is competition," Hallman said. "Because we believe there is a better way to deal with fonts, why is that 'punishing [Adobe]'? These arguments are anticompetitive," he said.

Both Hallman and Raikes shrank from the term "Chinese Wall," which has been used to describe the partition between Microsoft's systems and applications groups but said the company is very conscious of a perceived advantage. They insisted all developers are treated the same, whether they are internal or external to Microsoft, and added that all product information is kept confidential.

"This notion that Windows somehow was under a bushel basket and no one knew about it but our applications division does not square with the facts," said Hallman, noting that "literally hundreds" of independent developers had Windows applications ready to go during the May 1990 rollout of Windows 3.0.

That's absurd

Moreover, the "data does not support" the "absurd idea" that Microsoft's applications group unfairly benefits from the operating system group's near monopoly. "In a lot of applications areas, we are such a distant No. 2 that to conclude we have a monopoly is an abuse of the word," Hallman declared.

It is true that the systems group has taken advantage of a reverse flow of information, for example, object-linking technology. But Microsoft said it will entertain suggestions from any source. "I know for a fact the system group is working with several developers right now," Raikes said.

As for Microsoft's monopoly in the operating system side, Hallman said, "you could argue that MS-DOS is the reason the industry has grown to the size, value and import that it has. It's the reason the PC industry has exploded."

> "IN A LOT of applications areas, we are such a distant No. 2 that to conclude we have a monopoly is an abuse of the word."
>
> MICHAEL HALLMAN
> MICROSOFT

Both executives also responded to criticism that Pen Windows is nothing more than a vaporous preemptive strike against Go Corp., which unveiled pen-based computing software this year. "What should we do? Not enter the market? Choice is good for users," he said. The alternative, he added, is never to say anything until a product is ready to ship. "That makes for a terrible environment for corporate customers to plan in."

Raikes bristled at the charge that Pen Windows is nothing more than an idea on paper. He outlined a several-year history of Microsoft's interest not only in pen-based computing but multimedia and graphical interfaces.

Closing Arguments

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U.S. losing high-technology edge

Report says government, business must devote more money to research

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A broad-based coalition of industry, labor and university leaders said last week that the U.S. should alter its technological priorities to stem the loss of leadership in areas including electronics, information processing, materials and manufacturing.

The Council on Competitiveness capped a two-year study with a report saying the U.S.' position in many critical technologies is slipping and, in some cases, has been lost entirely. The report said the U.S. is leading or even with competing countries in 61 areas, including computers, software, communications and biotechnology. However, it also said the U.S. is losing or has lost the race in 33 technologies, such as memory chips, computer displays and several facets of manufacturing.

The council set forth 11 pages of recommendations, including the following:

- The president should direct government agencies to "increase dramatically" the percentage of federal research and development expenditures allocated to critical "generic" technologies — those basic areas that enable improvement on many commercial fronts.
- Congress should accelerate the depreciation of manufacturing equipment, make the R&D tax credit permanent and consider relaxing the antitrust laws that sometimes inhibit beneficial industry partnerships.
- Trade associations and consortia should share information about generic technologies as well as the cost and risk of developing the technologies.
- Companies should increase their funding for generic technologies, put more emphasis on manufacturing techniques and accelerate time to market though concurrent engineering and parallel product development.
- Universities should work more closely with industry to ensure that new technology finds rapid real-world applications.

The private, nonprofit group plowed little new ground in its recommendations. However, several members of the group said this latest call to action is the first broad-based agreement among government, industry, labor and university leaders. "It reflects a remarkable consensus; it's a singular accomplishment in that regard," said George Fisher, chairman of Motorola, Inc.

The report breaks with tradition in another way. "Given the reality of the federal deficit, this report does not request new [federal] money," said retired Navy Adm. B. R. Inman, who headed the study group. "It's a matter of [shifting] priorities."

Inman said the group did not necessarily favor canceling any "megaprojects" — such as the space station and the superconducting supercollider — but generally agreed that they could be stretched out to free up funds for more work in generic technologies such as intelligent manufacturing.

Conspicuously missing from the consensus so far is the White House, although Inman said President Bush had enthusiastically endorsed an earlier, and similar, council report in a 1988 campaign speech.

Others were less hopeful that the Bush administration, generally opposed to government sponsorship of civilian technology projects, would warm up to this latest call for help. At a hearing last week to discuss the report, Sen. Ernest F. Hollings (D-S.C.) said, "[The administration] says 'free trade, free trade.' That's the singsong I've had to listen to for 10 years while the country goes broke."

Sen. Albert Gore Jr. (D-Tenn.) was equally blunt. "There's a willful unwillingness to do this in the White House."

Weak links

Despite its strength in computer architectures and software, U.S. industry is judged to be trailing badly in the fields of memory chips, optical storage and displays

TECHNOLOGY	U.S. POSITION: Strong	Competitive	Weak	Losing badly/Lost
Logic chips		■		
Memory chips				■
Microprocessors	■			
Magnetic storage	■			
Optical storage				■
Software	■			
Computer architecture	■			
Operating systems	■			
Hardware integration		■		
Displays				■

Source: Council on Competitiveness

CW Chart: Tom Monahan

Pinch

FROM PAGE 1

Shrednick said. "It's not worth the investment in the new technology. I don't think the economy and the Gulf war have as much to do with [IBM's results] as the press would indicate."

IS spending by U.S. companies is expected to grow only about 5% this year, according to several surveys by consulting and market research firms. But the news for large systems vendors is even worse because capital budgets — the source of funds for big-ticket mainframes and minicomputers — are being squeezed the hardest.

According to a survey of 200 IS sites by Gartner Group, Inc. in Stamford, Conn., IS capital budgets will increase by a paltry 3.5% this year, down sharply from 7.7% in 1990. "In the fourth quarter, we found that people really lowered their growth plans due to the recession," said Stacey Flynn, program director at Gartner Group.

The combination of increased hardware price/performance and reduced IS spending may have IBM and other vendors caught in a kind of double whammy. While current mainframe users are either delaying purchases or finding lower cost alternatives such as re-leasing used CPUs, there is little source of new demand for big iron.

"Among my colleagues, fewer and fewer people need the big MIPers," said Warren Harkness, director of corporate IS at Bose Corp. in Framingham, Mass., and a board member of the Society for Information Management. "If you have them, you keep them, but people just aren't buying that second, third or fourth mainframe."

Even some of IBM's most coveted customers, buyers of the Enterprise System/9000, are in cost-containment mode. New York-based Manufacturers Hanover Trust Co. has purchased two ES/9000 Model 720s — not to greatly increase its mainframe capacity but to anchor its plan of consolidating eight data centers into two.

Trimming the bill

The consolidations will save an estimated $30 million per year in IS costs, said H. Edward Nyce, executive vice president of management information technology services. Corporate technology spending is down 2% to 4% this year at the $60 billion bank.

"IBM has a tough sell in hitting the marketplace in a very, very trying economic time," Nyce said. "I think there has to be an impact" on IBM revenue because of IS departments moving to smaller platforms, he said.

Another industry area to feel the squeeze may be new, emerging technologies without a proven record for investment payback. Companies are scrutinizing IS projects for fast, tangible impact in a tough economy.

"We put our money in projects that have customer value or payoff," Nyce said. "Those that are just nice to have get a lower priority."

At Corning, where the IS budget has been flat for three years, "we call it the 'Vital Few' mentality," Shrednick said.

IBM profits

FROM PAGE 1

to take IBM's concession as an early warning sign that the computer industry in general is in for a bad stretch.

The barriers that stalled IBM are unlikely to be surmounted by many other firms, analysts said. "Ninety percent of the U.S. computer industry is going to show terrible first-quarter numbers," Labe predicted.

IBM's talk of softening "across all geographies" is the most troubling news, said Martyn Roetter, a director at Cambridge, Mass.-based Arthur D. Little, Inc. "If IBM is correct about its own [international sales] situation — and there is no reason to believe otherwise — this speaks volumes about what companies with lesser overall strengths will encounter," Roetter said.

With Europe apparently plunging toward a recession, the impact will be widespread among U.S. computer vendors, according to Richard A. Shaffer, head of New York-based market research firm Technologic Partners.

Shaffer pointed out that computer vendors of every stripe and size have spent the past two years heavily investing in the European markets. Now, he and others predicted, the European economy is going to fall out from under those vendors, and the U.S. economy has not regained enough strength to compensate.

The fall will be twice as hard, according to many analysts, if the dollar continues to strengthen against foreign currencies. That could not only hurt sales but also reduce the U.S. dollar value of sales that are made. This could mean further industry consolidation, more downsizing with its danger of reduced service and support, less product development and higher prices.

Slip-sliding away

Growth in user expenditures is expected to slow down in all areas of the U.S. computer industry this year except for a modest rebound in multiuser systems

(Percent growth in user spending)

	Growth 1990	Growth 1991*
Multiuser (minis and mainframes)	-2.0%	1.0%
PCs/workstations/LANs	9.5%	7.0%
Packaged software	12.0%	8.0%
Services	11.0%	10.0%

*Projected

Source: International Data Corp.
CW Chart: Marie Haines

Some firms will fare better than others, analysts said. Nimble companies will outpace stodgy ones, and software and services will fall off less abruptly than hardware. "Software is more like meat and potatoes; it also tends to be cheaper and easier for an IS director to sneak through without corporate approval," Shaffer said. Leased and used computers could be in for a boost in popularity.

The firms best equipped to withstand worldwide economic woes, said Byron Walker, a credit analyst at Moody's Investment Services, Inc., will be those with strong balance sheets and sage management.

IBM's comeback will begin at the same time the worldwide economy's does, the company indicated last week. And as IBM goes, analysts said, so goes the computer industry.

Enterprise storage unveiled

Epoch Systems, Inc. and Storage Technology Corp. unveiled plans last week to jointly develop "a new class of storage systems" aimed at solving the dilemma of enterprisewide management of mainframes and Unix-based networks.

Scheduled to appear sometime next year, the new products are intended to "bring 'glass house-quality' storage facilities to the network computer," said Greg Kenley, chief technology officer at Epoch Systems in Westboro, Mass. The products will automate and control the storage and management of data from desktop systems to supercomputers by combining Epoch's Renaissance storage management architecture with Storage Tek's 4400 Automated Cartridge System library and storage products, company spokesmen said.

Louisville, Colo.-based Storage Tek also made an equity investment of less than 10% in Epoch Systems.

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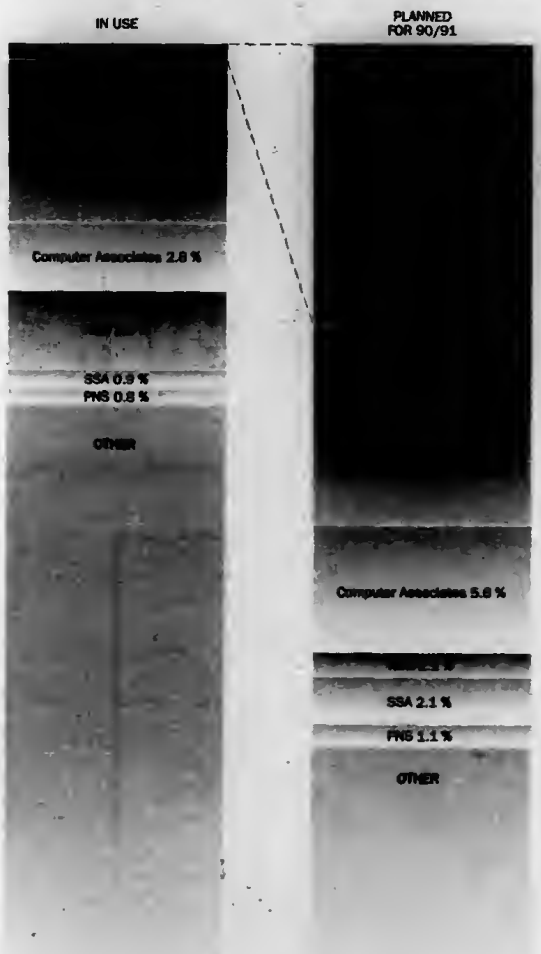

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Netware update has users cheering

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc.'s replacement of Netware 286 with Netware Version 2.2 last week drew applause from network managers who noted that Version 2.2 holds all of Novell's work group products and takes less time to install.

Novell combined its ELS Netware Levels I and II, Advanced Netware and System Fault Tolerant (SFT) Netware products to create a single Version 2.2. Netware 286 accounts for more than 80% of Novell's operating system unit sales, said Craig Burton, chief executive officer at Clarke Burton Corp., a research firm in Salt Lake City. Many of those user sites are small to medium-size firms.

Like Novell's high-end product, Netware Version 3.11, Version 2.2 pricing has been based on the number of users rather than its features, as was previous Novell software. Novell will market Version 2.2 for five users at $895, 10 users at $1,995 and 50 users at $3,495.

Many managers said they were surprised by Netware's contracted installation time. Brian Hughes, technical support manager at Idaho State University, said the beta-test version he brought on-line three weeks ago was installed in 90 minutes using 15 high-density disks.

Novell executives tell horror stories in which it took inexperienced administrators of Netware 286 networks more than one day to get a system running. Another beta-test user, C. E. Langenberg, data processing manager at Red Dot Corp. in Seattle, said Netware SFT required 49 low-density disks and as many as 106 disk swaps during the process.

Langenberg said Red Dot technicians could bring up the network in "a couple of hours," but people who had only occasional need to boot up a network could work an entire day at it.

Novell also cut installation time by making optional a hard disk error-checking routine that Langenberg said had consumed one hour of installation time in previous Netware 286 products.

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3Server gets LAN Manager

BY JIM NASH
CW STAFF

REDMOND, Wash. — Microsoft Corp. and 3Com Corp. will deliver an answer in May to the requests of owners of 3Com's 3Server who want to run Microsoft's LAN Manager network operating system.

Last week, a Microsoft spokeswoman said that Santa Clara, Calif.-based 3Com will ship 8mm and ¼-in. tapes containing OS/2 Version 1.21 for a price yet to be determined. The tape will hold, among other applications, LAN Manager Version 2.0 code, which will deliberately be missing one undisclosed LAN Manager file. Owners of 3Servers can then buy a copy of LAN Manager Version 2.0 to put LAN Manager in production.

Jay Misra, product manager for 3Com's 3+Open network operating system, said the tapes are slated to ship the first week of May.

Network administrators can load the tape in a 3Server and place the LAN Manager file disk missing from the tape onto an administrative workstation. By transferring the file to the server, the spokeswoman said, users get a fully licensed LAN Manager on a 3Server with all of Microsoft's support and warranty benefits. The process technically keeps the firms' promise that Microsoft would sell and support LAN Manager for 3Servers.

3Com decided last year to license its 3+Open network software, based on LAN Manager code, back to Microsoft. Since then, the spokeswoman said, many 3+Open users have asked for LAN Manager on their 3Servers.

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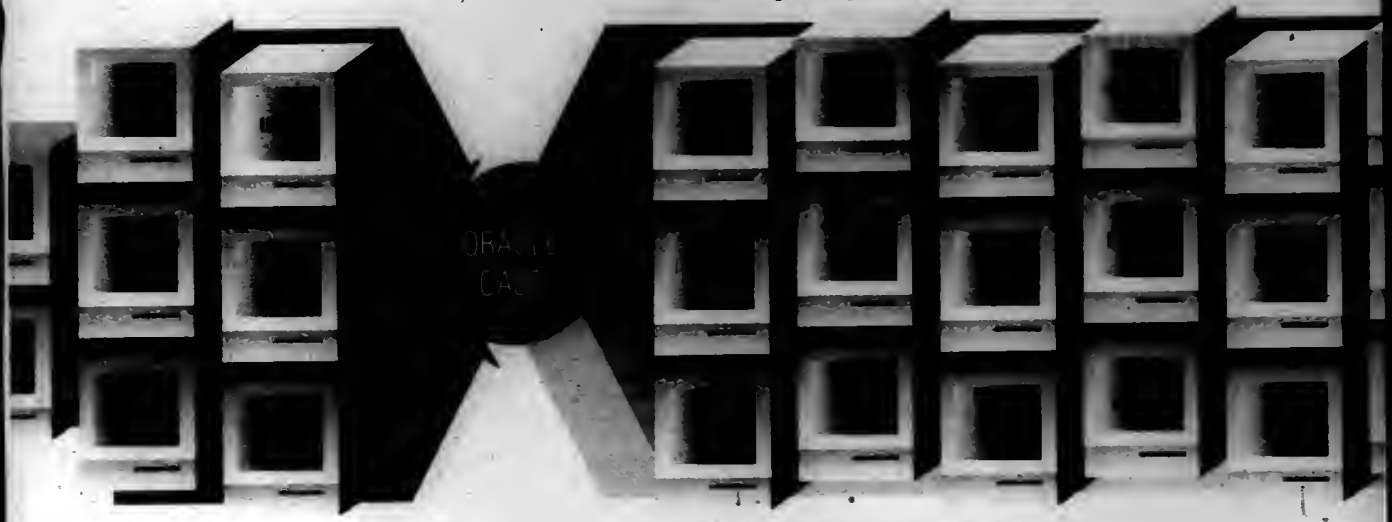

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AT&T's 5ESS switch to go wireless

BY ELLIS BOOKER
CW STAFF

HOUSTON — Riding the high-flying winds of wireless networking, AT&T Network Systems announced last week that its flagship 5ESS digital central office switch will have wireless capabilities by 1994.

The announcement, which came at Supercomm '91 here, was described by AT&T as a signal that it intends to significantly expand its global cellular systems business. The 5ESS switch is the most widely deployed digital switch in the world with more than 1,500 installations worldwide, according to AT&T.

The wireless feature will be compatible with both the Cellular Telephone Industry Association standards in the U.S. and Groupe Speciale Mobile in Europe, AT&T said.

The future 5ESS will be compatible with its existing cellular switch, the Autoplex System 1000, AT&T said. However, a company spokeswoman who said AT&T was adding the wireless capability to the 5ESS in response to customer demands confirmed the 5ESS now becomes AT&T's platform for wireless, wide-area networking.

AT&T Network Systems also brought one of the newer possibilities of videoconferencing to Supercomm. Along with Huntington Bancshares, Inc., it demonstrated how an automated teller machine (ATM) equipped with a video link can become a remote bank office. With AT&T smart card and Integrated Services Digital Network technology, an NCR Corp. ATM facilitated a real-time videoconference with a teller.

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Manager of Information Systems Technology,
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E-mail role in LA cop probe

BY JIM NASH
CW STAFF

Electronic messages transmitted between computers assigned to three Los Angeles police officers suspected in the beating of a black motorist could be used as evidence to show "intent to harm," according to legal experts.

A Los Angeles County grand jury investigating the alleged abuse of Rodney G. King on March 3 is including the transcripts as evidence. John C. Lautsch, an Orange, Calif., computer-law attorney, said the documents could "show intent to harm" on the part of the police officers sending the messages.

In the King case, potentially incriminating statements were transmitted between three squad-mounted Motorola, Inc. mobile digital terminals and a communications center console, a police spokesman said. He would not confirm or deny whether the messages are part of an internal investigation.

Observers are looking at the following verbatim exchange in particular.

First officer: "I haven't beaten anyone this bad in a long time."

Second officer: "Oh not again . . . Why for you do that? . . . I thought you agreed to chill out for a while . . . What did he do?"

First officer: "I think he was dusted . . . many broken bones later . . . after the pursuit . . ."

Legal experts said they know of no previous case in which electronic messages have been used as evidence in a criminal case. Most agreed that such communications are likely to be treated as recorded voice transmissions.

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Impact of Section 1706 still at issue

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Critics of Section 1706, a provision of tax law that affects thousands of contract programmers, said a just-released study by the U.S. Department of the Treasury gives them new ammunition for a campaign to repeal the language slipped into the Tax Reform Act of 1986.

However, the repeal effort, led by the National Association of Computer Consultant Businesses (NACCB), will run against the pro-1706 forces of Adapso, a computer software and services trade association. Adapso argued that the study bolsters the case for Section 1706.

Section 1706, which applies to programmers and analysts who get work through brokers, led to the reclassification of many of these workers as employees rather than independent contractors. Under Section 1706, the classification is determined by a test derived from common law instead of the more permissive rules used in other industries.

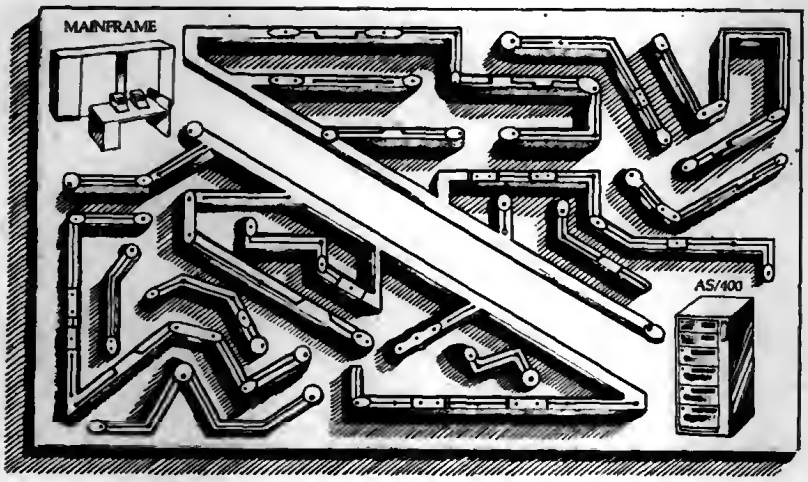
Much of the long-awaited report to Congress was inconclusive or ambiguous, which allowed both sides to find passages to their liking. Adapso, for example, agreed with the Treasury study that misclassification of employees as contractors is a significant problem and that Section 1706 has not disrupted the labor market or been too difficult to administer.

On the other side, Harvey Shulman, general counsel for the NACCB here, said the Treasury study "blows away" the original rationale for Section 1706, which was that brokers had an unfair advantage over other technical service firms because independent contractors tend to underpay their taxes.

The study showed that independent contractors pay the same amount of taxes as employees do and that Section 1706 is revenue-neutral, Shulman said. But Mitchell Gorsen, assistant general counsel for Adapso in Arlington, Va., countered that Section 1706 is only revenue-neutral under the "ridiculous assumption of 100% compliance."

The revenue effect of Section 1706 is important politically because a previous repeal effort was stalled by the question of whether removing Section 1706 would worsen the federal budget deficit.

The Treasury study did not make any firm recommendations about repeal or retention of Section 1706, but it did question the fairness of having different rules for technical service workers who use brokers and those who do not.



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Patriot airs portable plan

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — Patriot Partners, the software venture by Metaphor Computer Systems, Inc. and IBM, last week detailed its plan for encapsulating software so end users and developers will be shielded not only from differences in operating systems but also from writing new code when creating new applications.

Called Constellation, the project groups object-oriented code into components. "It's not a brick, like object-oriented code, and it's not a building, like an application, but a wall," said David Liddle, president of Patriot.

Like building a house on different kinds of soils, a developer would hide the specific mud, sand or operating system by using components that are geared to that operating system. Then, the developer, or users, would assemble other components, such as the floor, ceiling and walls of a house on top, without regard for the type of foundation. In an application, this would be like putting graphics tools on top of the operating system components.

Developers or end users could use components such as building blocks and only write code for the application desired.

Liddle claimed component software is different from object-oriented software, but developers said Patriot may just be adding new buzzwords to the lexicon.

"A lot of what was described was putting a slightly new set of words onto object-oriented programming," said Doug Pollack, vice president of marketing for object-oriented software developer Parcplace Systems in Mountain View, Calif. Components, however, appear to be a collection of objects with something in common having a common protocol.

Patriot plans to deliver detailed specifications to developers this year and have developers' kits available by mid-1992, a spokeswoman said. There will be no licensing fees — only the cost of developer kits.

In the long run, Liddle plans on using the Constellation concept to sell more software. Providing an easier method of building new applications for smaller groups of users could help future growth as well as keeping development costs down, Liddle said.

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*Digital Review. Reprint available.

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ADVANCED TECHNOLOGY

TECH TALK

Wait not, want not

■ Call-waiting signals are the bane of computer modem users. The signals distort the data flow and, in most instances, cause the modem to disconnect from the telephone line. The father-and-son team of Gerald and Bruce Goldman recently received a patent for a device that makes it possible for modem users to continue transmitting in the presence of a call-waiting signal. The device was designed to detect a call-waiting signal and reroute the call to ring the phone without disrupting the data flow. If the receiver of the call decides to pick up the phone, the device sends a signal to an identical unit on the other end and stops transmission. When the call is completed, transmission continues.

Lighting edge

■ Edge emitter light source may one day replace laser printing devices, according to executives at Westinghouse Electric Corp. and Tokyo Electric Co. The two companies have formed a joint venture to manufacture and market an edge emitter technology that they said delivers better resolution and gray-scale printing capability and is three to five times more reliable than laser printing devices. Edge emitter devices, based on a process developed by Westinghouse, derive their light from the edge of a thin film of zinc sulfide, discovered to be 100 times brighter than light from the face of the film.

Sammi in space

■ Kinesix, a division of Scientific Software-Intercomp, will begin marketing this month what the company said is the first graphical user environment that enables users to develop and customize graphical displays without complex coding. The Unix-based graphical user environment, called Sammi, allows users to alter the look and feel of an application without the time-consuming burden of rewriting computer code. It has been selected for use in the Freedom space station.

Parallel computer wins FLOPS race

Multiprocessing supercomputer judged to be far faster than sequential machines

BY MICHAEL ALEXANDER
CW STAFF

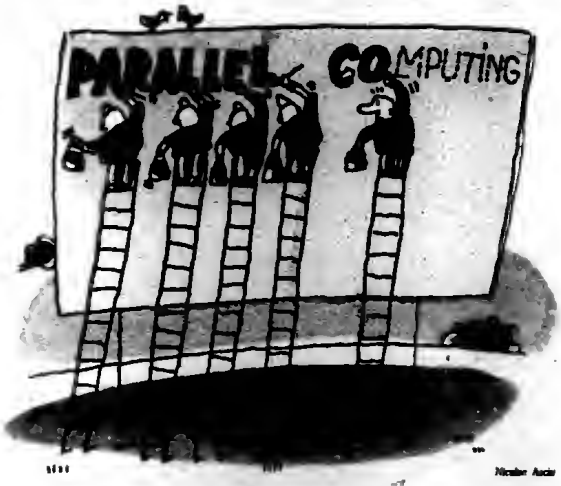
Researchers at the University of Tennessee last week declared a parallel computer built by Thinking Machines Corp. to be the world's fastest computer. The machine ripped off a stunning 5.2 billion floating-point operations per second.

The independently sponsored test confirmed what proponents of parallelism have long avowed: Nothing beats a parallel computer when it comes to raw power. The nation's top computer scientists, researchers and some corporate computer users are increasingly inclined to agree.

Conventional supercomputers will be obsolete by the mid-1990s, according to W. Daniel Hillis, president of Thinking Machines in Cambridge, Mass.

Thinking Machines and a group of 15 universities are collaborating on a parallel machine that will be capable of executing one trillion floating point operations per second. The computer is slated to be completed by 1993.

Parallel computers are the wave of the future because computer designers are beginning to bump up against the physical limits of single processor computers, according to H. T. Kung, a leading parallel computer scientist at Carnegie Mellon University.



Many hands, light work

Supercomputers work on computing problems sequentially. By comparison, massively parallel computers divvy up a problem among many processors. It is like choosing between having a single secretary in a typing pool type a 100-page report or giving 10 secretaries 10 pages each and putting them all to work at the same time, said Elizabeth Schermerhorn, deputy director of the Northeast Parallel Architectures Center at Syracuse University.

Applications written for parallel machines run up to 100 times faster than those executed on serial computers.

The long-held belief that software designed to orchestrate the work of many separate processors would not be designed for several more years, if at all, is finally beginning to fall under advances in programming, Schermerhorn said.

Parallel computers have been in use at academic and scientific labs for several years, and only recently have they begun their march into the corporate world. "There are a lot more of the things out there than people realize," Schermerhorn noted.

Intel Corp.'s scientific computer division, Ncube, Maspar Computer Corp., Supercomputer Systems, Inc. and Teradata Corp. are already marketing parallel machines. Supercomputer makers Cray Research, Inc. and Convex Computer Corp. are working on parallel computers, too. Last week, Digital Equipment Corp. said it planned to enter the parallel computer market later this year, perhaps in a joint effort with Maspar.

Early users of the technology are using the machines largely for scientific and engineering tasks; increasingly, they are being put to work on solving business problems. Dow Jones & Co., for example, has used a parallel computer for text database retrieval.

$E=MC^2$ (plus or minus)

BY MICHAEL ALEXANDER
CW STAFF

A supercomputer at Cornell University that is used to simulate gravitational collapse has produced results that challenge Einstein's general theory of relativity.

Cornell scientists said their computer simulation of Einstein's theory indicated that if a gigantic cloud of particles that was shaped like an elongated football gravitationally collapsed on itself, the regions near the pointed ends would abruptly compact into thin needles of infinite density and gravitational force.

However, these needle-shaped, "naked singularities" do not actually exist in outer space, said Stuart Shapiro, who helped develop the simulation with colleague Saul Teukolsky. The two are professors of astronomy and physics at Cornell. "If the theory says they exist, something is wrong with the theory."

Einstein's theory, which describes how matter warps space and time to produce gravity, is fundamental to physics. The theory is used to explain phenomena ranging from the alleged Big Bang that triggered the birth of the universe to the bending of light by the gravitational field of stars.

Cosmic hypothesis

Before the Cornell findings, physicists had hypothesized that the only singularities that could exist would be found in black holes in outer space. Black holes are regions in space where gravitational force is so strong that no matter or energy, not even light, can escape.

Because nothing inside a black hole can "communicate" with the rest of the universe, singularities inside black holes would be unable to disturb the behavior of the external universe. This hypothesis of "cosmic censorship" was first advanced by Roger Penrose, a physicist at Oxford University, in 1969.

The Cornell scientists have concentrated on highly asymmetric formations shaped like needles and pancakes to probe cosmic censorship. Those are the most difficult configurations to treat mathematically and require a supercomputer to investigate, the researchers said.

Shapiro and Teukolsky took three years to develop and test their supercomputer model, which runs on an IBM 3090 600J supercomputer at the Cornell National Supercomputer Facility. A typical run of the model takes up to 24 hours on one processor of the six-processor computer.

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DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
[illegible]			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 39% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audits & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

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Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

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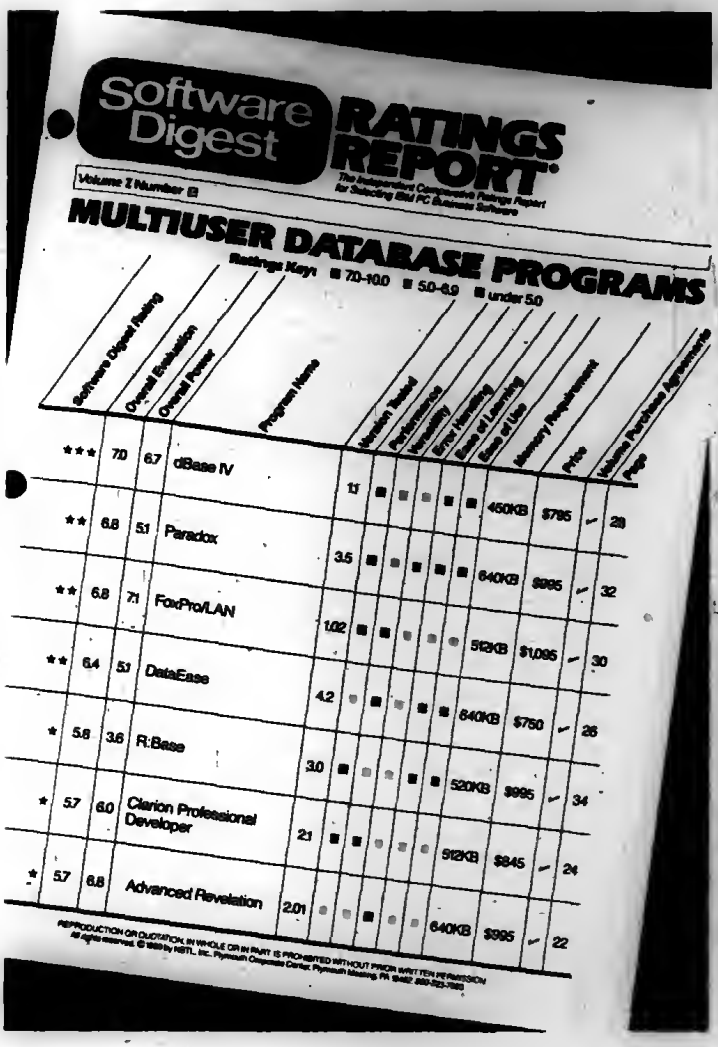
dTruth Comes Out.



Software Digest RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting Mid PC Business Software

Volume 7 Number 8

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 7.0-10.0 ■ 5.0-6.9 ■ under 5.0

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.8	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

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EDITORIAL

Margin notes

IBM THREW A large bucket of water on the stock market last week, reminding everyone that despite all the postwar rejoicing, there's still a recession going on.

Conventional wisdom has it that IBM's financial slowdown is more indicative of the market in general than of its own internal problems. But it's a good time to look at just how dramatically the dynamics of the hardware market are changing.

Ironically, IBM's cautionary earnings note coincides with recent glowing reports about the performance of its RISC System/6000 line of workstations and servers. In fact, the RS/6000 is proving a formidable competitor to IBM's pricey and proprietary Application System/400 mid-range line and even the low end of the mainframe family.

Analysts have also noted that despite erratic earnings, IBM's profit margins have declined steadily during the past six years. IBM has traditionally enjoyed profit margins that were the envy of every industry. That's because mainframe hardware could be counted on to generate up to 80% margins and until very recently, mainframes made up the vast majority of IBM's sales.

But the market is changing. The fact is that small, modular systems such as workstations and servers don't generate the profit of proprietary mainframes. As price/performance ratios spiral downward, the trend toward smaller systems is beginning to show up in the bottom line of the industry's biggest player.

This trend is being driven across the board by users and IS departments in America's largest corporations. Users are exerting greater influence than ever on the buying process with their expectations colored by glitzy demonstrations of supercheap MIPS. IS departments, aware that the issues of developing complex systems are a lot more involved than raw processing power, are taking these economies into account when making the final buying decisions. Their rule of thumb is to look at small platforms for development first and turn to the mainframe only as a last alternative. While "client/server" is still a hollow buzzword, you can count on applications emerging during the next two years that will give the concept some substance.

As we've said before in this space, the mainframe market continues to show surprising resilience and even modest growth. Proprietary architectures will be around for a long time, if only to support the enormous base of mission-critical software already installed on them. But the clear trend in hardware is toward a commodity market with the value added in applications software and networking. The changing buyer mind-set will drive prices lower and make margins narrower. That's the good news for users. The bad news is that the development tools to exploit this emerging class of cooperative computing aren't nearly as well developed as their host-based counterparts. The momentum is on the side of open systems, though, and it is only a matter of time before the new economics of computer hardware takes hold.

LETTERS TO THE EDITOR

Making the grade

I was amused by the report on Windows 3.0 in the March 4 issue, especially the section entitled "Users give key features high marks." Perhaps I'm old-fashioned, but I don't think that grades from C+ to B+ indicate particularly high standards for a product being touted as the primary graphical user interface for all non-PS/2 personal computers. In fact, I think it is just another example of the continuing tragedy of Microsoft, a company badly flawed by arrogance, carelessness and greed.

The incredible proliferation of software and freeware that is needed to make DOS bearable to work with in a professional environment is indicative of the poor job Microsoft did in designing version after version of DOS. Windows itself is designed to cover up the inept user interface that Microsoft DOS provides for the IBM-compatible PC.

I should be grateful to Apple: Only the continued success of the Macintosh forced Microsoft to provide anything resembling a multitasking, usable environment.

David Scott Goen
Systems Engineer
St. Louis, Mo.

Cause of failure

Regarding "Project Management tries anew," [CW, Feb. 18] the article ignores what I believe is the root cause for the failure of these systems: a lack of knowledge of the underlying processes of project management — a condition that better software will not mitigate.

Project management software is not, as stated, a "software product looking for an application." It is a software product looking for a defined process, skilled practitioners and finally, management that uses the information resulting from proper application of the processes. The key element in the justification of the acquisition of systems is the return on the investment of the application. I would submit that the majority of companies employing these systems cannot currently justify the investment.

I believe that there is a huge opportunity for the application of the analytical processes of project management in terms of potential productivity gains and cost savings, but in order for industry to take advantage, it must realize that the "magic" is not in the software. The application is merely a means that aids in the achievement of an end.

Wayne MacGregor
Vice President
Planning & Scheduling Systems
Project Management Technologies, Inc.
Littleton, Colo.

On the Rim

Your article, "Far East isn't recession cure-all" [CW, March 4], suggests that Pansophic Systems', Applications Software Division, has not pursued a Pacific Rim Strategy.

Pansophic Systems has long been established in the Pacific Rim. The applications software products have been in Australia since 1985, with offices in both Sydney and Melbourne since 1986. We have had strategic partnerships for sales and support in Singapore and Malaysia since 1985. In 1989, we established a strategic alliance in Hong Kong. We expect to be announcing additional partners in the Asian/Pacific area within the calendar year.

Pursuit of a global strategy certainly requires time and commitment from any organization. At Pansophic, we are completely committed to a worldwide strategy. We can assure your readers that the globalization of our business has been both challenging and rewarding.

John R. Wark
Vice President, Marketing
Applications Software Division
Pansophic Systems, Inc.
Lisle, Ill.

No confusion here

Regarding "No limelight for OS/2 at show" and "User gripes on OS/2 to spur IBM marketing blitz," [CW, March 11] your continued coverage of the OS/2 and Windows confusion makes the UI/OSF Unix struggle seem quite tame, reasoned and understandable. The confusion in the Microsoft/Intel world makes Unix an exceedingly viable and attractive solution for the desktop.

John Neubert
Director, Academic Computing
Drew University
Madison, N.J.

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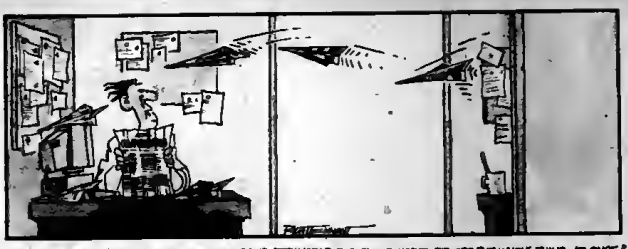

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30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
75. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
99. Vendor: Other _____ (Please specify)

2 **TITLE/FUNCTION** (Circle one)

IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs. Supv. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgr.

OTHER COMPANY MANAGEMENT

11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgr.
51. Sales & Mktg. Management

OTHER PROFESSIONALS

70. Medical, Legal, Accounting Mgr.
80. Educator, Journalists, Librarians, Students
99. Others _____ (Please specify)

3 **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.

A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

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Forget Milken, blame it on Kapor

How spreadsheets contributed to harebrained speculations

JOSEPH W. BARTLETT

As a practitioner specializing in finance and middle-market leveraged buyouts, I have been as astonished as the next man at the hyperbolic growth of extremely risky financings during the 1980s, a due bill now being honored in the insolvency courts.

This is good news for me in a professional sense. The recent cascade of troubled companies has been *sufficiently* deep and wide to revive my career, and those of others like me, as workout lawyers. It's deja vu all over again (as Yogi Berra would say) as we return to our stints in the early '70s representing debtors, creditors and trustees in bankruptcy court.

Still, one has to wonder, what brought us to this point? What got into Wall Street? What caused the players to run amok, providing financing for so many harebrained schemes? How did the financial buccaneers find their running room, adding debt upon debt until even valid business enterprises began to topple under the weight? Where was the "prudent man" during this feeding frenzy? Where were the bankers and investment bankers capable of saying "No"?

The shorthand explanation, popular in the press and literary circles, is that greed-crazed yuppies, infatuated with their BMWs and Park Avenue co-ops, went, in effect, bananas, dragging all around them into an abyss of superheated credit, lunatic investment decisions and general financial excess.

My problem with that explanation is that people have always been greedy. That's what capitalism has been built upon ever since Adam Smith explained the phenomenon. Why did we go crazy in the '80s and not the '70s or the '60s or some other decade?

"Big picture" types, mostly from the political left, answer that question by citing Ronald Reagan and the Social Darwinism his administration both preached and practiced. Reaganomics is a handy scapegoat now that Reagan is out of office and can be kicked around without fear of a vigorous response.

Again, I wonder. The fiscal and monetary policies of the Reagan administration may have appeared revolutionary, but that was mostly the effect of conservative rhetoric. The Reagan programs were, by and large, consistent with the policies of earlier administrations. Reagan's defense spending increases, for example, were in line with what Jimmy Carter had been up to. And while Reagan did cut federal income taxes and, as with all tax cuts, the rich tended to be favored, those tax benefits were largely soaked up by increased state and local taxes.

One is therefore compelled to look for unique events which might explain the phenomenon — free variables in the calculus which appeared for the first time during the 1980s or at least had their first real impact during that decade. Once one isolates an element not extant in any of the comparable periods, then there is a plausible candidate for some sort of cause-and-effect theory.

Someone recently wrote that the bizarre decline in the test scores of American primary and secondary students, particularly whites, is probably to be laid at the feet of the one ubiquitous new factor accompanying, more or less linearly, that decline — the advent of television and the consequent renunciation of preteenage and teenage reading.

Using the same mode of reasoning, I would identify the one unique element in the landscape of the 1980s as the promiscuous use of computer spreadsheets.

While this might seem trivial to many, for those of us who have been in the corporate finance business over an extended period of time, it is clear that the spreadsheet has revolutionized financing techniques.

It has done this primarily by enabling all hands interested in securing investment capital to enhance their presentations with a dazzling array of seemingly compelling numbers (all in the nature of forecasts, to be sure), which show "conclusively" why a given loan or investment will make the capital provider rich.

In a sense, we have Bill Gates and Mitch Kapor to thank for the astonishing rise (building to a crescendo in the RJR/Nabisco transaction) of imprudent investment decisions. In the '80s, if somebody wanted to collect a ton of money in order to lay their hands on assets, the investment bankers prepared a "book" in which they laid out a discussion of the business on the micro level and the market for the firm's products on a macro level (with much of the information cribbed from standard reference guides) and then wound up with the high fastball — a shower of numbers projecting future results.

We have always had projections, of course, and projections have always been optimistic. But what Gates, Kapor and other giants of the software industry enabled the young shamans of the 1980s to accomplish was an irresistibly dazzling array of numbers. The effect was mesmerizing — to see was to believe and to act. As *Time* magazine would have put it in the argot practiced there under the late Henry Luce, backward reeled the mind.

Bartlett is a New York-based partner in the national law firm of Gaston & Snow.

We can't keep ducking the touchy-feely stuff

LARRY M. SINGER

Let's be honest. For the average information systems manager, delving into the intricacies of personnel management is a somewhat distasteful task that ranks in priority just below "Should I have tacos for lunch?" and just above "I'd worry more about AD/Cycle if I could ever understand the damn thing."

Managers are so concerned about projects, deadlines and budgets that they seldom have the time, inclination or background to ponder the complex and often vague issues that surround the equally complicated human side of IS. Yet managing human trends is becoming a matter of survival.

It is already clear that, as we move into the 1990s, things are changing radically and IS professionals no longer fit nicely into traditional corporate molds. Organizations that do not face up to these changes will face even worse problems with projects, deadlines and budgets. They will also face even more crises, triggered by staffing deficiencies and plummeting morale.

Some of the critical personnel issues facing IS at this juncture are the following:

- Part-time employees and leaves of absence.
- Older employees.
- Obsolete job titles.

The old-fashioned and simplistic picture of an entire department of full-time employees working nine to five is no longer accurate.

An IS manager who automatically rejects any employee who is not able or willing to work the traditional hours may lose critical options. Part-time employees can be highly productive if they are self-motivated and properly managed.

Leaves of absence are becoming a complicated subject for many companies. The growing number of two-income and single-parent households make it increasingly likely that employees will occasionally have personal or family situations that force a difficult choice: Obtain a leave of absence or quit.

It is more difficult to manage a staff when one or more key players is out for several months, but granting such leaves will show the rest of the staff that the company does attempt to help its employees. Loyalty in one direction is often rewarded with loyalty in the other.

Contrary to common expectation, allowing leaves does not trigger a flood of requests. Employees may talk about leaves, but relatively few will actually request one. In the real world, a leave of absence is traumatic. Besides the obvious loss of income, the person inevitably feels some degree of separation anxiety and guilt about leaving his or her work for others.

Older employees present a different challenge. Data processing may be a relatively new profession, but some of the early participants are now in their mature years. In the early days, managers were typically those with the most experience or knowledge and staff were those employees with the least. This is no longer necessarily the case.

IS managers may now find themselves with employees who have more experience, more knowledge and more user contacts than they have. It is clearly more difficult to properly manage an older employee than the programmer/analyst with two years experience who is thankful for every morsel of wisdom from a more experienced manager. Difficult, but not impossible.

IS managers must adapt their management tactics to accommodate the new demographic reality: encouraging older employees to share their knowledge with greener staff members; adjusting the amount of direct supervision to individual requirements; and learning to ask for advice and suggestions.

It is also time to rethink job titles. Too many IS departments use the same boring job titles. Our classic job descriptions seem etched in stone, and managers react with surprise when anyone suggests a change. After all, didn't Charles Babbage himself coin the terms programmer and systems analyst? If they were good enough for the 19th century, shouldn't they be good enough for the 1990s?

No, they aren't. Despite the condescending attitude of many managers, titles *are* important, especially to those who strongly feel their job titles do not match their duties. Specialization is the natural outgrowth of an increasingly complex world embracing multiple application platforms and new approaches such as computer-aided software engineering, but the customary titles and job descriptions seldom match reality. Traditional job titles applied to nonconventional duties cause resentment and undermine morale. Titles do count — often more than salary.

Not all of these ideas will be welcomed by the personnel department or other parts of the corporate bureaucracy. Companies often allow inertia to interfere with sound people management. But the stakes are too high to ignore the battle. Those IS directors who develop and champion an active approach to people issues will give their organizations a competitive advantage.

Singer is the author of two books on data processing and *Communications for MIS Professionals and Managers*, soon to be published by McGraw-Hill, Inc.

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SOFT NOTES

Firms ink VAR pact

Epoch Systems, Inc. and Prime Computer, Inc. recently signed a value-added reseller agreement authorizing all of Prime's commercial systems and Computervision computer-aided design and manufacturing sales offices and distributors to resell the entire line of Epoch-1 Infinitestorage servers and Infinite-storage software.

The worldwide contract provides a "valuable addition to Prime Systems Integration's ability to provide its customers with integrated information systems," according to Gerald Butler, president of Prime Systems Integration business unit. Epoch Systems provides several storage technologies, including on-line archiving and network backup and recovery systems capability.

The Unix-based systems market is showing excellent growth throughout the Asian region when compared with the overall systems market, according to a recent report by International Data Corp.'s Asian Research Center.

The study estimates the compound annual growth rate for the region is at 46.9% for total Unix-based hardware shipments. This is compared with 23.3% for the overall hardware market, the study said.

Science and IS drift together

IS looks to high-performance computing for resource-saving strategies

BY MARYFRAN JOHNSON
CW STAFF

ORLANDO, Fla. — As corporate networks grow and multiply, stronger ties are being forged between the business-oriented information systems world and the once-isolated divisions of scientific and technical users.

That trend, according to executives attending an IBM conference here recently, is slowly elevating the importance of high-performance computing in the corporate view.

"Scientific computing is vital," said Thomas Lane, director of the Numerically Intensive Technical Computing Center at Dow Corning Corp. "It is an incredible way to maximize the corporate resources."

Jeffry Canin, president of Canin Consulting in San Francisco, agreed. "The complexity of networking and maintaining overall corporate control is bringing a return of MIS involvement" to scientific and technical computing, he said.

Describing The Dow Chemical Co. as "technically driven but focused on marketing and customer needs," Lane said greater reliance on scientific computing can offset the costs of laboratory testing, which in turn cuts costs in waste disposal and compliance with safety regulations.

Variations on that theme were echoed by others among the 450 executives, who came from national research laboratories, universities and industry to attend IBM's Technical Computing Executive Conference.

The trials of managing heterogeneous networks dominated many of the conversations during the three-day meeting.

"Networking that works and cheaper supercomputing" were the watchwords for Scott Glaspie, manager of external research and development at Monsanto Corporate Research in St. Louis, Mo. "There is a strong drive among our vice presidents to communicate quickly and easily," Glaspie said. "There is also an increasing need for access from the PCs to the mainframe, which brings up all sorts of issues such as security."

Management expertise

Jerry Latta, vice president of IBM's Technical Computing Systems Division in Milford, Conn., said he believes scientific and technical users are increasingly turning to IS for the expertise to manage these multivendor networks.

Another change IBM has noticed in the manufacturing sector is certain customers' willingness to write the IBM applications programs for their machines, then have IBM maintain the system over its lifetime. "It saves them money in the long run," said Robert Tiel, a senior consultant at IBM's Industrial Sector Division.

Tiel said he also sees a "changing management attitude" toward the views of the technical users. When the IS department does battle with the engineering department, Tiel noted, "the engineers are winning 99 times out of 100."

There was a distinctly businesslike cast to the potential benefits listed for high-performance computing: solving practical problems, reducing time to market and increasing productivity.

"We feel the market pressure to develop and produce at a high level," said Chip Kemppainen, manager of computer-aided engineering at ADC Telecommunications, Inc. in Minneapolis. His firm, which counts regional Bell operating companies among its customers, merged its technical and business computing departments during the past three years to eliminate unproductive infighting over resources.

FEATURE: PICK SYSTEMS

More than an operating system, it's a cult classic

BY ALAN RADDING
SPECIAL TO CW

Can you update and reposition a sleeper and wind up with a box office hit? Microsoft Corp. has certainly made that argument with its new release of Windows, and that's what Pick Systems is trying to do now with its Pick operating system/database.

As an operating system, Pick has been something of a cult classic for more than 20 years, although how much of one is still open to debate. Pick Systems claims Pick is licensed on 270,000 multiuser midrange and workstation systems and 110,000 single-user personal computers, while a 1991 Datapro Research Corp. study put the installed Pick base at 260,000 CPUs, not counting PCs, according to Datapro analyst Herb Gepner.

What is indisputable is that Pick has a fervent following wooed by Pick's easy ways and multiuser capabilities.

"I was really skeptical when I heard about it, but it's remarkable how flexible it is," says Barry Windus, director of MIS at Potpourri Collections in Medfield, Mass.

Pick Systems has always insisted that its product is more than an operating system, however. Now it is aiming to expand its base and tap a new population of

Continued on page 32

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Computer watchdog tracks hazards

Federal crackdown on hazardous materials tracking spurs utility to automate manual system

ON SITE

BY MAURA J. HARRINGTON
CW STAFF

LOUISVILLE, Ky. — The U.S. government's crackdown on the tracking procedures for handling hazardous materials was a major factor in Louisville Gas & Electric Co.'s (LG&E) decision to convert its manual tracking system to a mainframe-based automated system.

Now two years old, that system has saved the utility hundreds of thousands of dollars per year, largely by eliminating the expense of outside contract work and by smoothing the federal inspection process. The rules on hazardous materials come from the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

The Hazardous Materials System (Hazmat) is a homegrown program that is linked to LG&E's Materials Management Information System, according to Terry Naulty, LG&E's manager of environmental affairs.

The hazardous materials system is accessible to users when they are working with the Materials Management Information System through IBM 3270-type terminals. The applications reside on an IBM 3090 Model 200J mainframe.

The communications link is via IBM's Systems Network Architecture and several types of communications media, including fiber-optic cabling and microwave, depending on the location of the site, said Ken Brockman, LG&E's manager of technical support.

Easy search and retrieval

Hazmat, completed in 1989, was written by LG&E in two years. Its purpose, according to George Seitz, manager of systems development at LG&E, is to let employees at any LG&E site easily search and retrieve information on any hazardous materials used in the company.

Written in Cobol, Hazmat is accessible via a menu under IBM's VSAM and CICS. Users need only press one key on their terminal to get into Hazmat. Then they simply follow the menu-driven directions to find the desired information, according to Seitz.

Users may be employees, such as data entry clerks, or shop floor workers who process work orders for materials.

Naulty, who headed up the design of Hazmat, quantified LG&E's savings from it as "hundreds of thousands of dollars a year and lots of work."

Louisville Gas & Electric *saved thousands of dollars when it automated its manual tracking system on an IBM 3090*

"Before Hazmat, we had to make sure files were being kept at each facility and updated on a regular basis," Naulty said. "For example," he added, "we also had to take monthly and weekly inventory records and figure out the maximum and minimum readings for each material, and we're talking thousands of materials, each with its own report." Naulty noted that many of the materials used at LG&E are deemed hazardous by the government but are unlikely to be recognized as such by the general public.

"Hazardous materials include welding rods and plate steel, which wouldn't seem like hazardous materials sitting on the shelf but give off fumes that are considered hazardous, so they must be recorded carefully," Naulty said.

When a user is working with the inventory list in the Materials Management Information System, an automatic link to Hazmat tells the worker whether any products contain hazardous materials as defined by OSHA and the EPA.

When Hazmat detects a product that includes one or several hazardous materials, it copies the information from its own dictionary and generates a special government form.

Because the system is companywide, all hazardous information can be tracked throughout LG&E's 17 different sites, Naulty said. Also, Hazmat can automatically generate annual and daily activity reports that regulate the total amount of hazardous materials used during the specified period.

Since last January, Hazmat has been marketed to other companies across several industries by EPI International, a software development and consulting firm based in Atlanta.

Candle enhances DB2 storage analysis system

BY JEAN S. BOZMAN
CW STAFF

LOS ANGELES — Candle Corp. said last week it will soon ship a new version of its DB2-DASD storage analysis program to the 1,300 DB2 sites that use Candle's Omegamon for DB2 systems monitoring software.

The new version enhances the original program, shipped in November, which monitors the use of disk space by IBM's DB2 relational database management system.

Buff Jones, general manager at Candle's Database Tools Division, said, "Database administrators would like to set goals for disk drive usage and to get control of DB2's allocation of disk space." A goal of 15% free space is adequate, she said.

Counting the cost

Candle's enhanced DB2 package includes a new cost/benefit analysis program that puts a price tag on the amount of unused disk drive space allocated for DB2 data tables.

Sometimes as much as 40% to 60% of costly disk drive real estate is unused, wasting $85,000 per year for databases that are 5G to 20G bytes in size, Candle Chief Executive Officer Aubrey Chernick said. "You can reclaim some of that wasted space by defining new parameters on the screen," he said.

The Candle software identifies which data sets should be moved in order to free up more disk space.

> "DATABASE administrators would like to . . . get control of DB2's allocation of disk space."
>
> BUFF JONES
> CANDLE

DB2-DASD, now being tested at large DB2 sites such Levi Strauss & Co. in San Francisco, is scheduled to be available in the second quarter. It is priced between $8,000 and $32,000, depending on the size of the host IBM processor.

The Candle program runs under IBM's MVS/ESA, MVS/XA or MVS/SP operating systems and supports DB2 Version 2.1 and later DB2 releases.

Oracle 6.2 not for Vaxclusters alone

Unix vendors hoping to see other Parallel Server Option versions by 1992

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Will Oracle Systems Corp. be able to transplant Oracle Version 6.2 Parallel Server Option beyond the Digital Equipment Corp. Vaxcluster for which it was created? A number of Unix systems vendors and parallel processor makers appear to think so and are trying to make it happen by 1992.

Pyramid Technology Corp. is already working on a distributed lock manager that would enable the firm to "cluster" multiple Reliant series machines together [CW, March 18].

"It's a multilevel project that will release products in different stages," said Mark Bishop, database marketing director at Pyramid. "But we're working on something that allows multiple systems to run against a single database."

Pyramid rival Sequent Computer Systems, Inc. in Beaverton, Ore., is developing its own version of a distributed lock manager, said Rich Wells, Oracle program manager at Sequent.

Development of an equivalent to DEC's distributed lock manager is a prerequisite for making Oracle Version 6.2 work.

"We've had code in-house for more than four months," Wells said. "We're very confident that we can get a beta product out the door by the end of this year."

Production copies of the code will probably not surface until 1992, he said. Still, the argument for clustering is compelling, as customers will be less likely to "box swap" when processing needs outstrip the capacity of their installed computers. Users could "scale up" their systems by tacking more computers onto an existing cluster.

Parallel targets

Parallel processors are another target for the Oracle Parallel Server Option, said Kenneth Jacobs, director of relational database management systems marketing at Oracle. "We know it works, and we'll see it rolling out in the supercomputer area sooner than we will in the traditional computing area," he said.

Brad Bradley, director of marketing at Meiko Scientific Corp., agreed. A working version of Oracle Version 6.2 exists, Bradley said. "We've been working on it for the last 18 months, and I would say that working with Oracle was very much a two-way street."

Meiko's lock manager is functioning, and a beta-test release of the product should be ready by the third quarter, Bradley said. Meiko uses Sun Microsystems, Inc.'s industry-standard Scalable Processor Architecture and Intel Corp. i860 reduced instruction set computing chips.

Richard Wyckoff, company spokesman at Ncube, said last week that although Version 6.2 is up and running on its parallel processing machines, "Oracle 6.2 is not in a final form or at a point where we could sell it."

Oracle Chief Executive Officer Larry Ellison has said one of his goals is to use Ncube's parallel processing computer to run the Oracle RDBMS at 1,000 trans/sec. or more.

"Oracle 6.2 is designed in such a way that it should be portable to other systems," said Charles Phillips, vice president of research at Soundview Financial, Inc. in Stamford, Conn. "But the Pyramid and Sequent versions are kind of showcase platforms for Oracle because Oracle's trying to show their commitment to the Unix market."

Supercomputer versions will also prove valuable to Oracle marketing, Phillips said, because extremely high transaction rates can be demonstrated for the Oracle RDBMS on those machines. "But in terms of revenue, the Vaxcluster platform was the most critical one for Oracle 6.2."

Design market seen soaring

1991 revenue for CAD/CAM/CAE industry predicted to hit $7.7 billion

BY SALLY CUSACK
CW STAFF

CAMBRIDGE, Mass. — Core business revenue for the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) industry will reach a whopping $7.7 billion this year, according to Daratech, Inc., a market research and consulting firm based here.

Basing these numbers on worldwide sales of CAD/CAM/CAE hardware, software and services by U.S. firms, Daratech projected the overall market would reach $25 billion by the middle of the decade.

In his keynote speech, Robert M. Williams, vice president of engineering and plant operations systems at IBM, told the 300 users at this year's Daratech conference that CAD purchase decisions have been elevated from the departmental level into the boardroom in major firms across the country.

"If a CAD system goes down, companies could have thousands of engineers sitting on their hands," Williams said.

Just browsing

Most users came to the conference to learn about new technologies and to examine the strategies vendors were offering.

Robert Sullivan, assistant technical service manager at Teleco Oilfield Services, Inc. in Meriden, Conn., came to "see what the trends are and learn more about different platform options."

Teleco Oilfield is currently using Xerox Corp.'s hardware combined with homegrown software to implement CAD applications in its measurement-while-drilling activities.

Sullivan indicated that the company is looking to put more decision-making capabilities into the hands of the engineers while giving them the ability to perform more up-front analysis functions.

The firm has considered several architectures, including Digital Equipment Corp. and Sun Microsystems, Inc.'s Sparcstations, but no decision has been made yet.

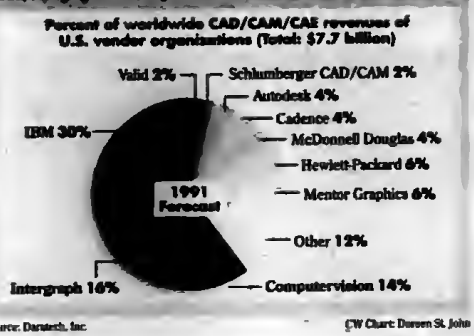
Daratech currently ranks IBM, Intergraph Corp. and Computervision, a Prime, Inc. company, as the industry market share leaders.

While the research company forecast 12%, 10% and 10% growth rates, respectively, for these companies within the next 12 months, analysts are keeping an eye on how the sluggish economy will effect the CAD business.

According to Charles M. Foundyller, president of Daratech, most vendors have reported first-quarter slowdowns and are "proceeding with caution." He said most U.S purchase decisions are being delayed by an average of three to six months, and more approvals are now required for capital expenditures.

Three-way battle

More than half of the 1991 CAD/CAM/CAE market is likely to go to IBM, Intergraph and Computervision



Source: Daratech, Inc. CW Chart: Doreen St. John

Pick

FROM PAGE 27

potential customers by concentrating marketing and development efforts on database functionality and emphasizing Unix for the operating system role.

"People call Pick an operating system, but as an operating system, we're lousy. We have no color, no graphics, no communications. What we've always been is a multiuser database application environment," says Steven Kruse, vice president and general manager at Pick Systems.

> "PEOPLE CALL PICK an operating system, but as an operating system, we're lousy."
>
> STEVEN KRUSE
> PICK SYSTEMS

Pick Systems sees Pick ultimately as a relational-like database similar to Oracle Systems Corp.'s Oracle, Ingres Corp.'s Ingres or Informix Software, Inc.'s Informix, which run under a variety of popular operating systems, starting with Unix. Advanced Pick, an upgrade that makes Pick Unix-compatible, was released last July. A single-user PC version running under DOS is in beta testing and is scheduled for release in June, Kruse says.

Advanced Pick is notable for more than its shifting of emphasis away from Pick as an operating system. It also marks a new initiative on the part of Pick Systems, which has seemed content to let Pick licensees do most of the innovating.

Reactions to its first effort are mixed. Jim Jobson, president of Pick developer Rigden, Inc. in Boulder, Colo., is enthusiastic about Advanced Pick. "I rewrote a pricing module in a week using Advanced Pick. If I had tried to do the same thing in R83 [the 1983 release of Pick, considered standard], it would have taken a lot longer," he says.

Alan Glassman, a Pick software development consultant in Houston, is less impressed. "While we sat here watching DOS go all the way to Windows, Pick goes nowhere," he says.

Users have been slow to move to Advanced Pick. Kruse estimates that half of new Pick sales on the PC are Advanced Pick, while only 10% of new minicomputer Pick sales are for Advanced Pick.

Storybook Heirlooms, a start-up catalog marketer in Menlo Park, Calif., uses Advanced Pick because that is what the catalog marketing application it bought from Rigden runs under. Storybook systems manager Ann Killeen likes Pick because "you can understand it. It's so sensible."

Picked because of Unix

The agency computer development and marketing group at Hartford, Conn.-based Aetna Life and Casualty Co. opted for Advanced Pick because it operates as an application running under Unix, manager Ken Clark says. The group liked a particular application that was available on Pick, but "when we did an evaluation, there was concern about Pick as the operating system," he says. With Advanced Pick, however, Clark's group could have both the Pick application and Unix.

The Unix option has become a driving force for Pick. Unix gives Pick the communications and graphics capabilities it lacks, while Pick gives Unix users access to its universe of more than 4,000 business applications. Sandra Gant, a Gartner Group/Infocorp analyst, concluded in a recent Pick report, "The marriage of Pick and Unix has rejuvenated the Pick market."

Many Pick users agree. "Communications is a problem if you're running Pick in native mode, but running under Unix, communications is fine," Windus says.

The ability to take advantage of newer, leading-edge hardware is also enticing. Running under Unix will free Autostyle, Inc., a manufacturing firm in Grand Rapids, Mich., from its dependence on an old, proprietary Ultimate Corp. 7000 running Ultimate's licensed version of Pick, according to MIS manager Carrie Rodgers-O'Neal. "We're looking for a major vendor: HP, IBM, DEC," Rodgers-O'Neal says. "We're using an Ultimate 7000 machine, and we've had two head crashes in six months."

While the Unix connection and Pick's availability on the PC (see story below) have extended the appeal of the system, it is Pick's classic benefits — portability, ease of programming and availability of applications — that still hold users.

"We fell into Pick six years ago," says Tom Ward, manager of information systems at Ferguson Enterprises, a plumbing and electrical wholesaler in Newport News, Va. In that time, Ward has virtually dispensed with operations support altogether. His shop has six programmers and no operations staff.

By comparison, Ward cites a smaller company with a traditional mainframe system that needs 18 programmers and 18 operations staff members to support fewer users and fewer applications. "With Pick, we do more with one-third of the development staff and none of the operations staff to speak of," he says.

Testing portability

Ferguson has tested Pick's portability, growing through a variety of Honeywell/Ultimate systems from Honeywell, Inc. to the Unix/Sequoia system from Sequoia Systems, Inc. The most recent migration to the Unix system took Ward's six-person programming staff a total of just two man-weeks to convert and verify 1,200 programs, he says.

Sometimes, it is the seemingly smallest things that make the biggest difference. The Plymouth County Registry of Deeds in Plymouth, Mass., was attracted to Pick because it allows variable-length fields, a product of Pick's architecture. "I can't stress how important that is to us," says Richard Seibert, assistant register of deeds.

The registry must track hundreds of thousands of names of property owners; misrecording or improperly abbreviating a name can have serious legal and financial ramifications.

If Pick can manage its preferred transition to database operations while continuing to please its older core of users, observers and users say, it will truly have the best of both worlds — the trait of a survivor.

Radding is a free-lance writer based in Newton, Mass.

Pick a smaller system

The Pick operating system/database is not limited to large and midrange systems: Pick runs on a PC, although not under MS-DOS. There are DOS products, however, that provide a level of Pick compatibility.

Advanced Revelation Version 2.0 from Revelation Technologies, Inc. in Bellevue, Wash., runs under DOS while having a variable-length architecture similar to Pick. Pick users take advantage of the Advanced Revelation architecture to move data between DOS and Pick applications.

Using Revelation, Beauty for All Seasons, Inc. in Idaho Falls, Idaho, effectively runs Pick on a PC network, MIS manager Wade Snedaker says. Beauty also runs Ultimate's version of Pick on its main Honeywell minicomputer. "The only difference with Pick on the PC is that it is not as smooth," he notes.

The Kittery Trading Post in Kittery, Maine, uses Revelation to handle data generated by the cash register system, which it passes to its primary Pick system. The problem, however, "is that it's not real-time" because Revelation must be used to translate the DOS cash register data into Pick format, says Jim Cronin, director of MIS. If and when Kittery moves to Pick in the Unix environment, he notes, the firm can get a real-time point-of-sale system that dumps data directly into the Pick files.

ALAN RADDING

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NEW PRODUCTS — SOFTWARE

System software

Banner Software, Inc. has announced an enhanced version of VSM/VM, a systems management software package designed for IBM mainframes.

The product's Autopilot component controls consoles and interactive applications as well as network functions. It can also automatically initiate at least one VM, VSE or MVS system and components such as VTAM, CICS, TSO and ISPF.

Pricing for a VSM/VM package that includes Autopilot begins at $9,000.

Banner Software
9719 Lincoln Village Drive
Sacramento, Calif. 95827
(916) 364-0900

Applications packages

Access Technology, Inc. has announced Release 3.0 of 20/20, an integrated spreadsheet package designed for Digital Equipment Corp. VAX/VMS machines.

The product's spreadsheet publishing capability enables users to create and output presentation-quality reports of spreadsheet data, the vendor said. A search-and-replace feature allows users to search a spreadsheet for text strings and replace them with other strings.

Pricing ranges from $600 for a Vaxstation to $42,000 for a VAX 9000 system.

Access Technology
2 Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

Allen Systems Group, Inc. has announced Job Alert, a real-time, historical job problem management tool designed for MVS environments.

The product monitors initiated tasks and the completion of batch jobs, records corrective actions and archives job control language listings.

License fees are priced from $15,300 to $22,400, depending on CPU group.

Allen Systems Group
750 11th St. S.
Naples, Fla. 33940
(813) 263-6700

Utilities

Data Center Software, Inc. has announced a software package designed to run as a detached, batch or on-line process for monitoring systemwide or individual conditions on a Digital Equipment Corp. VAX machine.

Monitor/Plus can identify system components that contain diminished disk space, excessive I/O and CPU use, unavailable Decnet nodes and stalled or stopped queues.

Statistical and usage reports reportedly enable system managers to configure the product to react to system glitches according to their requests.

Pricing ranges from $1,995 to $4,995, depending on VAX CPU size.

Data Center Software
70 Herrick St.
Beverly, Mass. 01915
(508) 922-5500

NEW PRODUCTS — HARDWARE

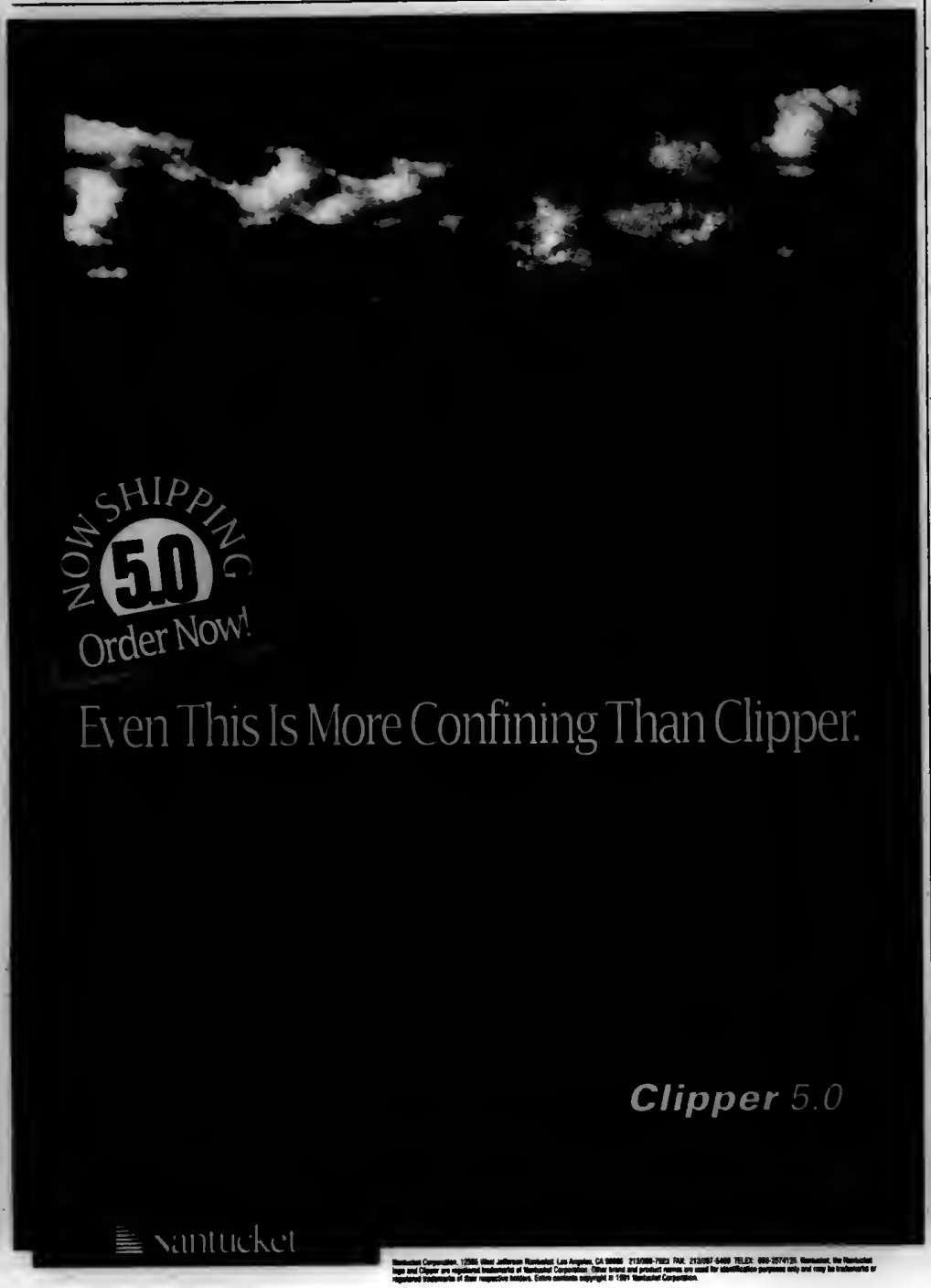
I/O Devices

IBM has announced an impact printer that reportedly enables users to print multipart forms, cards, envelopes and labels at a rate of 800 lines per minute.

The IBM 6252 Impactwriter features a right-to-left paper path design that allows all maintenance and operator jobs to be completed at the device's front end. An 80-character LCD panel that reports messages in plain English and two forms-feed tractors that can be adjusted by turning a single knob are included.

Five models are available for midrange systems, large enterprise computing environments and small computer platforms such as the IBM Personal System/2 and RISC System/6000. Pricing ranges from $9,950 to $12,450, depending on model.

For more information, contact your local IBM office.



COMMENTARY

Richard Pastore

Picking a portable

Many Compaq LTE 386S/20 users said they bought the notebook PCs because six months ago they were the only ones available from a name vendor. But with notebooks now shipping from AST, Dell, Tandon, Sharp and others, the market has matured to a point where the makers must vie for users' dollars with differentiated designs. It's time for buyers to base their purchases on substantive features.

Power: On the desktop, Intel 80386SX-based platforms are such a commodity that the choice is virtually moot. But in notebooks, a 20-MHz 386SX can cost 25% — or $1,000 — more than an 80286-based model. So if you don't need to run Microsoft Windows, you could save some money here.

Drives: By all accounts, Conner Peripherals has got its 60M-byte drive act together. The hard disks are now showing up in everybody's notebooks. IBM will even ship the 60M-byte disk as a standard with its much-discussed but still unannounced PS/2 L40SX portable. Unless the machine will forever be a one- or two-application platform, it probably makes sense to pay the extra $500 for

Continued on page 43

Truetype troubles slow Windows upgrade

Integration of scalable fonts into the popular graphical interface lengthen update schedule

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. will not deliver its update to Windows 3.0 until at least October because of difficulties incorporating the new Truetype outline font technology into the core of the new release, according to sources briefed by the company.

Windows 3.1 was originally scheduled for a midyear rollout, but its arrival date is now uncertain, sources said, and beta-test versions are just now slowly trickling out.

However, Truetype is expected to be widely available later this year as part of System 7, Apple Computer, Inc.'s next major release of the Macintosh operating system.

Insiders said the delays directly relate to Truetype, outline font technology jointly developed by Microsoft and Apple as a way to break market leader Adobe Systems, Inc.'s stranglehold on that market.

"Truetype has become more of a technological challenge than they first thought," said an information systems manager at a large telecommunications company.

Truetype is apparently not the only thing delaying Version 3.1. "Last we heard, there were still bugs in the shell, and they haven't yet chased down the drive letter problems," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond.

Truetype is intended to allow users to scale, rotate and otherwise manipulate fonts. Version 3.0 users have long complained that its bit-mapped fonts cannot be scaled, while outline fonts can be scaled to any size based on a mathematical description. Bit-mapped fonts are often slow to display on-screen, print inconsistently and demand big chunks of hard disk space because each font must be stored separately on disk.

Truetype will be incorporated directly into the Windows Graphics Device Interface, making the font available for all applications. The package will ship with 13 standard Truetype fonts, Microsoft Chairman Bill Gates said.

> INSIDERS SAID THE DELAYS directly relate to Truetype, outline font technology jointly developed by Microsoft and Apple as a way to break market leader Adobe Systems' stranglehold on that market.

Microsoft officials are also faced with the challenge of getting printer manufacturers to commit to Truetype before they actually get their hands on the product.

A market leader

Adobe's Postscript is already well-established as the market leader in page description languages, and some manufacturers have been hesitant to abandon that standard.

Leading the way, Apple recently announced two low-cost printers that are the first printers on the market to take advantage of the Truetype technology.

Truetype Version 3.1, which will be compatible with Version 3.0 applications and drivers, is also expected to exploit object linking and embedding capabilities and address complaints about Version 3.0's file manager, which has to revert to DOS commands to perform a number of functions.

R:base gets link to outside applications

BY JAMES DALY
CW STAFF

BELLEVUE, Wash. — Microrim, Inc. has released an extension to its R:base database management system enabling R:base applications to transparently connect with non-R:base applications.

The new Dynamic Application Integration (DAI) feature allows an R:base user to integrate other applications into R:base menus and programs or run any application, such as a DBMS, word processor, spreadsheet or graphics program, from within the R:base environment.

For example, a developer can write an application that runs accounts payable database applications, can mail-merge letters through a word processing application and can generate graphics, all while using R:base as a central application menu.

The DAI feature introduction is a key element of the first release of Microrim's Upgrade Express program, which Microrim President Jack Noonan said will provide a steady diet of functional product enhancements three times per year. The first release of Upgrade Express includes DAI and several speed improvements.

An Upgrade Express subscription will cost $129 per year, although Microrim is offering a special introductory price of $99 until April 30. The upgrades can also be purchased individually for $99.

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NBC airs 'Desktop Challenge'

Executive may need Solomon's wisdom and a gypsy's crystal ball to decide

ON SITE

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Off in one corner of his toy-filled office, Apple Computer, Inc. and IBM account representatives fight over scratched out logos in a miniature Japanese rock garden. But Joe C. Harris Jr., director of information technology at NBC TV Stations, has another battle to worry about — the one churning up his gut: user-friendliness vs. communications.

That about sums up the line of demarcation that divides competing desktop strategies based on Apple's Macintosh operating system and IBM's OS/2. Harris has the unenviable task of trying to choose one.

The unexpected wild card in this showdown was Microsoft Corp.'s Windows 3.0. Its rocketing popularity, along with a little pressure from MIS, forced Harris to audition it, but in the end, it was the first to get the hook. The less noticed OS/2 outclassed Windows on several fronts — including communications and memory management — and held its own in ease of use and manageability.

Harris today oversees six NBC-owned TV stations and seven sales offices populated by about 1,200 users. These sites are currently running traffic and financial systems on IBM Application System/400s. A sales information system runs off of a third-party IBM 3090. NBC is predominantly IBM.

A growing proliferation of personal computers, coupled with a move by the TV stations to cut costs, had intersected with a directive from NBC's chairman to make it as easy as possible for customers to do business.

Harris decided that a consistent, multitasking desktop might be key. Just when he thought OS/2 was the way to go, Windows 3.0 "burst on the scene like a flood," and he began to notice Apple opening up. So there he was, "trapped in a triangle" he "could kill the world for."

Networking was also key. Here again, Windows fell short, said Glenn Urbanski, manager of sales and traffic systems at the division. The workstations have to tie into a network linking the 3090, the TV stations' AS/400s and the corporate token-ring.

During the summer of 1990, Harris and his team put together a blueprint for the ideal desktop. It had to be cost- and system-efficient, easy to use and manage and able to provide a consistent interface. Above all, it had to be something people would use.

"If you have 20 workstations and only 10 are used, you are losing money," Harris pointed out.

Exploring options

Assisted by his peers at parent company General Electric Co., a heavy user of both OS/2 and the Macintosh, and a two-man team at NBC, Harris has spent the last six months exploring the nether reaches of Windows, the Macintosh and OS/2.

Each man was assigned to a different system: Harris, a fan of Lotus Development Corp.'s 1-2-3/G, took OS/2; Alan Bernstein, manager of systems administration and operations, got Windows; and Urbanski worked with Apple.

Harris went to IBM, Apple and Microsoft, explained his predicament and demanded they each build him a prototype to prove their system was the answer to his problems. After they each complied, he then refused to let the companies teach "the big dummy — me" how to use the systems. The point was to test user-friendliness.

"If you tell me, I will hear; if you show me, I will see. But if you let *me experience it*, I will know," he explained, citing Chinese philosophy.

After weeks of building, testing and benchmarking, only Windows was axed. Harris was virtually back to square one. Both OS/2 and the Macintosh fit the bill. The prime difference comes down to NBC TV's perception that the Macintosh is much more user-friendly and a more factually based belief that IBM's connectivity is not only further along but also better suited to NBC's technology base.

Ironically, Harris, who worked with the OS/2 system, is leaning toward what he sees as a user-intuitive Macintosh. Conversely, Urbanski and Bernstein appear to be favoring IBM, primarily because of its robust connectivity and ability to tie into NBC's IBM investment.

Harris talks constantly about the role communications plays in enabling the sales staff at the TV stations to do their jobs. In fact, he is a big proponent of using electronic data interchange. In the short term, he worries the most about getting users comfortable with their systems as well as keeping a lid on the system support and maintenance costs. None of the TV stations have on-site computer support.

The goal is a "user-stupid" system, meaning users are not to be excessively tied up in training classes or left spinning their wheels while the system slowly executes commands. System basics must be attainable as close to immediately as possible.

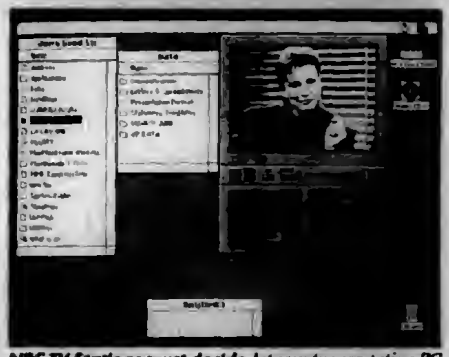
What the final decision will be is anyone's guess, including Harris, who at this point would rather wrestle with his taxes than pull a workstation strategy out of the hat by mid-April. At NBC, however, tax refunds are on Apple as the desktop of choice.

Fasten your seatbelt

Harris fell into his job

It probably qualifies as the zaniest office at NBC TV Stations. Telephones ring, technicians fiddle, and heads constantly poke through the doorway when Joe C. Harris Jr. is in town. Yet Harris sits unruffled amidst the chaos. Between answers, he shouts minimally worded instructions, confirmations and dates at the constant stream of people wandering in and out of his office, pausing only to order soda and to castigate his OS/2 setup, which will not allow him to exit a program as fast as he would like. Today, his AS/400 is down.

Harris is a former newsman and salesman who stumbled into his current project, in part because of his fascination with electronic gadgets and a tendency to speak his mind. Harris thought his 14 NBC-owned TV stations and sales offices needed to have intelligent PCs and a standardized suite of applications. So his boss said, "Fine. You go do it." And Harris has been off and running ever since toward a mid-April "D-Day."



NBC TV Stations must decide *between two competing PC desktop strategies: the Apple Macintosh and IBM's OS/2-based Personal System/2*

DAT backups free systems managers

BY JIM NASH
CW STAFF

Digital audio tape (DAT) technology has hit personal computer networking and minicomputer environments in the form of fast, large-capacity tape drive backup systems. DAT backups are freeing up computer managers, some of whom were flipping cartridges 20 times per day.

Niel Svendsen, network administrator at Mobil Chemical Corp. in Beaumont, Texas, said he had grown frustrated with the speed and limited capacity of conventional tape backups for his two IBM Model 80 file servers.

The servers support about 70 IBM Model 55 workstations linked with Novell, Inc.'s Netware 286 SFT on a Datapoint Corp. Arcnet backbone, according to Svendsen.

Mobil picked up Carlsbad, Calif.-based Gigatrend, Inc.'s 2G-byte Serverdat backup system this year using an IBM Personal Computer AT bus. It reduced the overnight systemwide backup task to three or four hours without shutting down the network, Svendsen said.

Even three hours is too long, he said, so he has ordered an IBM Micro Channel version from Gigatrend, which he said is expected to reduce backup time to less than one hour. Svendsen said his only disappointment with the product so far has been inadequate documentation.

Other users said Gigatrend's capacity has boosted productivity by cutting down the number of times a cartridge must be flipped or replaced. "It boosts productivity to have one tape hold the whole thing," said George Shay, a software engineer at Panasonic Factory Automation in Franklin Park, Ill. Panasonic develops factory-automation software, he explained, and the source code for one program can stretch to 6M bytes or more.

Panasonic decided to use a Gigatrend Serverdat 121 with 2.5G bytes for its 40-workstation Novell Version 3.11 network because it is the largest backup that works on an Extended Industry Standard Architecture bus, Shay said.

Switching tapes on heavily used networks can get "messy," Svendsen said. With conventional systems, he explained, "if tape ran out in the middle of a backup, I'd have to catalog the tapes as the first part and second part. As it is, we have not come close to filling up a DAT tape."

> "IT BOOSTS productivity to have one tape hold the whole thing."
>
> GEORGE SHAY
> PANASONIC

ALR's Powerflex 20CSX offers flexibility, speed

Technology Analysis — A roundup of expert opinions on new products. Summaries written by Computerworld *staff member Derek Slater.*

Flexibility and speed are the selling points of Advanced Logic Research, Inc.'s (ALR) Powerflex 20CSX system. Reviewers praise the performance of Powerflex, an Intel Corp. 80386SX-based system that allows an easy plug-in upgrade to an 1486 CPU. However, they note that the absence of 32-bit slots limits the system's 486 potential.

Performance: Benchmark scores place the 20CSX near the head of its class, according to *PC World* and *PC Magazine*. The system fares well in CPU, disk and video speed tests. An unusual bonus is the extra 80286 chip on the motherboard, which operates as a backup if the 80386SX CPU breaks down. Though the system can carry a full 16M bytes of random-access memory, the motherboard limits CPU RAM speed to 5M bytes, which can slow the performance of space-hungry applications.

Expandability: The Powerflex has one 8-bit and five 16-bit expansion slots.

Documentation: *Infoworld* rated the documentation as very good. Included are system specifications, a glossary and explanations of on-screen error messages.

Support: ALR depends on dealers for technical service. Toll support lines are open during West Coast business hours.

Value: The suggested retail cost of a system, including Super VGA card and monitor, 3M bytes of RAM, a 110M-byte hard drive and a mouse, is $3,349. Reviewers said the Powerflex is a good value with a few noteworthy limitations.

Reviews Summary

Criteria			
Performance	Very good	Very fast	[illegible]
Expandability	[illegible]	[illegible]	[illegible]
Documentation	Very good	NC	NC
Support	[illegible]	[illegible]	[illegible]
Value	Very good	RAM ceiling a problem	High-priced
Reviewer's score	[illegible]	[illegible]	[illegible]

Published reviews score represents Infoworld *rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.*

RATINGS

- **Users:** user at a large insurance firm (*overall performance:* 9, *cost:* 10); Kevin Weigel, Wimpey Minerals PA, Inc. (8, 9)
- **Analysts:** George Thompson, Datapro Research Corp. (8, 9); Jerry Caron, Faulkner Microcomputer Reports (8, 8)
- **Financials:** Eric Zimits, Rauscher Pierce Refsnes (*overall rating:* 5); Stephen K. Smith, Paine Webber (7); Jim Poyner, William K. Woodruff & Co. (4)

"They have $30 million in cash, and we're expecting another good result this quarter," Smith said.

"ALR's growth rate is about 20%, with a weaker balance sheet than the market leaders," Poyner said.

ALR Powerflex 20CSX

score:

Points (maximum)	Category
23 (30)	Published reviews
16 (20)	Analysts' ratings
13 (15)	Users' ratings
19 (20)	Cost evaluation
8 (15)	Vendor financials

(Maximum score: 100)

ALR responds

Comments from David Kirkey, vice president of marketing:

Performance: With the 486 CPU, this product performs as well as any 486 industry standard architecture system and for less money. If you're going for a fully configured 32-bit system, try our Businessveisa line.

Financials: We have money in the bank; the company is very solid. Revenue and profits have grown consistently.

Dell System 320LX: Good price, exceptional support

Dell System 320LX

score:

Points (maximum)	Category
23 (30)	Published reviews
13 (20)	Analysts' ratings
14 (15)	Users' ratings
13 (20)	Cost evaluation
11 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Performance	Good	Slow	Conservative
Expandability	[illegible]	[illegible]	[illegible]
Documentation	Excellent	NC	NC
Support	[illegible]	[illegible]	[illegible]
Value	Good	Excellent	Higher than average price
Reviewer's score	[illegible]	[illegible]	[illegible]

Published reviews score represents Infoworld *rating only. NC: No comment. These are excerpts. Refer to actual reviews for details.*

RATINGS

- **Users:** David Schexnayder, southeastern utility company (*overall performance:* 10, *cost:* 7); David Uechi, Brown Marooney & Oubre Hartline (9, 10)

"I haven't had any downtime, and it's been compatible with every software or hardware [product] I've put in it," Schexnayder said.

"It's real durable, and I need the extra expansion slots in the large chassis," Uechi said.

- **Analysts:** George Thompson, Datapro Research Corp. (6, 8); Jerry Caron, Faulkner Microcomputer Reports (7, 9)
- **Financials:** Eric Zimits, Rauscher Pierce Refsnes (*overall rating:* 7); Jim Poyner, William K. Woodruff & Co. (8)

Dell responds

Comments from Paul Rubin, director of product marketing:

Performance: The 320LX was not designed to be the fastest computer in our line. It was designed to be the first 20-MHz 386SX shipping, and as such, it established Dell as a leader in being early to market with an important new processor.

The 320LX provides the user with the productivity of a 386-based PC and a low 386SX price.

Although the Dell System 320LX does not set any speed records, reviewers say that the system is reasonably priced and that Dell offers exceptional service and support.

Performance: *Infoworld* describes the 320LX's benchmark results as average. Dell's entry lacks the memory cache common to many of its Intel Corp. 80386SX-based competitors. However, it does use BIOS shadowing and an IDE hard disk controller.

Expandability: Because it has a much larger case for an SX system, the 320LX has room for eight expansion slots. The power supply capacity is an appropriately high 200 watts. There are five half-height drive bays, and reviewers note that drives are simple to install or remove.

Documentation: The manuals are very thorough. A diagram inside the machine makes it easy to identify system components, according to reviewers.

Support: Dell's support policies and service are tops in the industry, reviewers agree. Toll-free telephone support and support by fax are available during extended weekday hours and on Saturdays. A 30-day money-back guarantee and one year of free on-site service are also standard.

Value: The list price is $3,398 for a 320LX system equipped with 4M bytes of random-access memory, an IBM Video Graphics Array adapter and monitor, a 100M-byte hard drive and a floppy disk drive. Reviewers say the price is right for users who need expandability and strong support more than they need blazing speed.

Methodology: *Published reviews: average of numeric scores from product reviews published by personal computer publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of financial analysts' ratings of vendor financials and ability to support product multiplied by 1.5.*

Insignia delivers MS-DOS on Next

Emulator software opens Next to thousands of DOS-based applications

BY PATRICIA KEEFE
CW STAFF

MOUNTAIN VIEW, Calif. — Those who are smitten with Next, Inc.'s Next system but cannot or will not leave behind their DOS applications may find that Softpc 2.0 — scheduled to be available from Insignia Solutions, Inc. at the end of the month — will let them have their cake and eat it, too.

Softpc is a software emulator that essentially clones an IBM Personal Computer AT motherboard. The program also runs on computers from Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co., Apple Computer, Inc., Silicon Graphics, Inc. and Mips Computer Systems, Inc.

The trade-off, according to Nick Baran, editor and publisher of "Baran's Tech Letter," lies mostly in performance. He said Softpc is very slow, only runs programs written for Intel Corp. 80286-based computers and does not support IBM's Video Graphics Array standard or Microsoft Corp.'s Windows 386. "It's a useful product, but I think it will have a limited appeal," he said.

It is estimated that there are currently between 100 and 200 applications designed for the Next shipping vs. more than 50,000 MS-DOS packages.

However, Baran said he is skeptical that users would buy a Next machine if they wanted to stick with their DOS applications. He added that users can find database, word processing and spreadsheet programs for the Next. Lotus Development Corp., for example, offers the Improv spreadsheet for the Next.

Opening DOS doors

Steven P. Jobs, president and chief executive officer of Next, is more effusive. "Softpc will open up the entire MS-DOS world to Next computer users," he said.

Jobs also predicted that Softpc for the Next will make the system more attractive to the installed base of DOS-based PCs.

Insignia said interest in the $499 package is already high. "Our initial backlog indicates this to be one of our most successful launches ever of Softpc," said Don Gallagher, vice president of sales at Insignia.

The Next computer provides Softpc 2.0 with one of its fastest performance rates, according to Insignia. Softpc runs under Nextstep 2.0 or later versions. It allows Next users to run AT-compatible software and Next programs side by side as well as share files between the two environments and copy and paste between windows. Users can also network with other workstations running Softpc.

The Next system's Adobe Systems, Inc. Postscript environment allows DOS screens to be captured with Softpc for use as images in other applications.

Softpc is a software emulation, allowing users to run more than one MS-DOS session at a time. Softpc for Next computers includes support for IBM's Enhanced Graphics Adapter and Color Graphics Adapter graphics standards as well as support for the Intel 80287 math coprocessor and expanded memory.

Computer Solutions changes name, focus

BY PETER BARTOLIK
CW STAFF

BURLINGTON, Mass. — A firm from an era that preceeded personal computers, Computer Solutions, Inc., has changed its name to Powersoft and dramatically shifted its scope with the introduction of Powerbuilder, a client/server application development environment for Microsoft Corp. Windows users.

Computer Solutions, founded in 1974, was historically focused on MRPII applications but is recasting itself "from a low-tech to a high-tech, advanced technology company," claimed Mitchell Kertzman, president and chief executive officer.

Powerbuilder 1.0 supports SQL and initially will be integrated with the SQL Server from Sybase, Inc. and Microsoft, Sqlbase from Gupta Technologies, Inc. and Oracle Server from Oracle Systems Corp. The product is geared toward information systems operations as a high-level development tool featuring its own Powerscript procedural language.

Heading the development of Powerbuilder was David Litwack, senior vice president of the company and formerly executive vice president of Cullinet Software, Inc. Litwack said he believes "we are at the beginning of a mass migration" of IS to client/server development as the profession responds to mandates from corporate management to downsize IS operations.

"To develop this type of product, you have to merge two worlds: The mainframe guys are character-based, and the PC guys tend to think in an end-user mentality," Litwack said. Powersoft, which claims to have already signed licenses with American Airlines, Coca-Cola Foods and Smithkline Beecham Corp., is banking that IS operations will eschew the C language and other Windows programming tools in favor of a select number of high-level development applications.

The product, scheduled to ship in May, costs $2,995 per seat for a development license.

Pastore

FROM PAGE 37

the long-term capacity.

Modems: Modems are almost a given on computers that travel. But now there are fax modems as well as regular data modems to consider. Fax modems are a great convenience and a potential money saver. Everyone you do business with has a fax machine — but not everyone has a network you can dial into.

Power management: Some models allow you to shut off the notebook and swap batteries without rebooting. Nothing could be more convenient when you're in the middle of a database search and the final boarding call comes.

Batteries: There is still little differentiation here and a lot of deception. One vendor may rate its battery at three hours; another will say "up to" 3½ hours. The net result is you get only two hours of real-life use out of them. When the greater capacity, nickle-hydride technology begins showing up, users will have a real battery choice.

Reliability: Laptop computers fail twice as often as desktop PCs, according to one national PC service provider. Notebook buyers should be especially concerned because the machines trade their ruggedization for light weight.

Well-established players such as Toshiba and Grid have had time to hone their quality control. But the bargain-priced newcomers to the market may not have the materials and manufacturing experience to put together a solid box. Their service and parts networks are also in their infancy; finding fast, convenient support may be quite a challenge, according to independent service providers.

Ergonomics: Many car shoppers are swayed by the overall look and feel of cars as much as they are by *Consumer Reports'* ratings. Notebook vendors are paying more attention to such feel-good features.

Developers such as Compaq and Dell say they spend months surveying users to see if they like the floppy drive on the front or the side of the unit. They develop nonslip pads on the base, hinges that feel solid and stay where you put them, case latches that can't be unlocked accidentally and keyboards that feel like their desktop cousins. Together, these features can make a difference to the user.

A pound or two in the hand isn't worth as much as a unit's dimensions. Full-function systems such as the LTE and Tandon's NB/386SX will weigh from six to eight pounds for the time being. The ideal notebook size is 8½ by 11 in. — the size of a piece of typing paper. This size is a standard fit in the business world, whether you're talking desk drawers or briefcases. Adding a few inches, as IBM has done in its L40SX, may jeopardize spatial harmony.

Pastore is a *Computerworld* senior writer.

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CW11/A

Computer still a baby, Joy says

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Propelled by progress on several fronts, desktop computers in the 1990s will grow exponentially more powerful while becoming dramatically easier to use, said William Joy, co-founder and vice president of research and development at Sun Microsystems, Inc.

To an appreciative audience of Sun users who gathered recently at the National Air and Space Museum, he explained "Joy's Law," which states that Sun workstations approximately double in performance each year. That means a Sun unit will compute at 1,000 million instructions per second by 1994, Joy said.

Sun workstations in 1994 will be good for 1,000 million floating-point operations per second, will have 1,000M bytes of memory and will attach to 1,000M bit/sec. networks, Joy said. "I know how to do this, but it's hard," he said. "We might be a year late."

Joy gave some clues about Sun's approach. Microprocessor clock speeds will increase modestly from 40 MHz to 66 MHz, but they will boost from one to three times the number of instructions executed per clock tick, an approach called superscalar processing. The top-of-the-line models will come with eight processors, Joy said.

What's down the road?

In a talk titled "The Future of Computing," Joy predicted the popularity of "nomadic devices" — electronic books, portable communications devices and the like. He also said computers will become an integral part of offices, conference rooms and theaters. For example, Joy said, systems will automatically make videos of meetings, index them for text retrieval using voice recognition and put the results into networked databases for later access by others.

"It's important to have a philosophy of innovation. We're in the very early days of computing, like automobiles in the 1920s," Joy said. Sun's vision is one of low-cost workstations, dedicated to a single person, with the power of a supercomputer linked to the world by networks, he explained.

Joy castigated corporate bureaucracy. "Truly bright people are a nonrenewable resource, and most of them are at small companies. In very large companies you also have bright people, but less densely, and they spend their time in meetings persuading others to get out of their way."

He said Sun's rule is: "By default, the answer is yes." That approach would not work everywhere, he conceded, such as in the loan department of a bank.

The larger computer companies have other problems, Joy asserted. "Computer companies founded before 1980 are in economic trouble because they misunderstand who creates value for the customer. It's the software writers who do that."

Sun has written about 2 million lines of system software in the past 10 years, Joy said. By the year 2000, it will have written 10 million to 20 million lines, almost all of it in the user interface for things such as voice processing, natural language programming, handwriting recognition and "heads-up [virtual] 3-D graphics," he said.

MICRO BITS

Zenith Data cuts prices

Zenith Data Systems, following on the heels of IBM, Compaq Computer Corp. and Dell Computer Corp., cut prices on select models of its desktop personal computers from 5% to 11.5%. The cuts affect four of its six desktop platforms, including its bottom-of-the-line Intel Corp. 80286-based PC and its top-of-the-line Z-386/33E. A Zenith Data spokesman downplayed competitive pressures, citing "normal course of business" as the reason for the cuts. Zenith Data cut prices on its desktop machines two months ago.

Next, Inc. announced that it has begun shipments of its $7,995 Nextstation color PC. The Nextstation uses 16 bit/pixel to display color images on its 17-in. monitor and also offers a 2.88M-byte floppy drive and 105M-byte hard disk, officials at the Redwood City, Calif.-based firm said. Next's high-end 32-bit color product, Nextdimension, is scheduled to ship next month.

Sun Microsystems, Inc. recently announced that its SunOS version of Unix has received X/Open Consortium Ltd.'s XPG3 Portability Guide Base certification. The XPG3 branding indicates that SunOS provides standard programming interfaces for the development of applications that can then be ported to various platforms.

Geoworks, Inc., developer of PC/GEOS and Geoworks Ensemble environments, recently signed a runtime license agreement with Dimensions Research, which produces the VP Planner family of spreadsheet products. Under the agreement, Dimensions Research will develop several applications for use with the PC/GEOS graphical user interface, the first of which will be a three-dimensional spreadsheet.

Imaging tool packs punch

BY RICHARD PASTORE
CW STAFF

Desktop publishers who would like to store high-resolution graphics on a network server have been stymied in the past by the unwieldy size of the data packets.

A 24-bit color image amounts to a 5M-byte, network-straining file. Some companies are offering image compression as a solution to this problem.

Torrance, Calif.-based start-up Video & Image Compression Corp. began shipping Picture Packer two weeks ago, a utility that compresses color and gray-scale images at ratios of 5-to-1, 20-to-1 and 30-to-1. It will shrink a 5M-byte image file to 172K bytes, a size more palatable for an Ethernet network, according to company President John White.

Compatible with IBM Personal Computers and compatibles, Picture Packer compresses and decompresses images with up to 24-bit color definition.

The $79 utility uses the Joint Photographic Experts Group algorithm for compression and works with desktop publishing applications and peripheral devices that support several popular graphics file formats.

BIOS promises laptop gains

BY MICHAEL FITZGERALD
CW STAFF

NORWOOD, Mass. — The advent of high-powered, battery-operated laptop computers is leading to some vendor creativity that could pay users dividends.

Phoenix Technologies Ltd., a maker of BIOSs for the personal computer market, brought out Phoenixview/LC, a video BIOS designed especially for laptops. According to Phoenix, the new BIOS runs video as much as 40% faster than other BIOS designs. It also has built-in power management facilities for laptop users.

Such a product could benefit laptop users who want to run graphical programs such as Microsoft Corp.'s Windows or Geoworks Ensemble.

"Anything that's going to drive the screen faster in graphics mode in fact is going to benefit any user moving to the Windows environment," said John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H.

Phoenixview/LC is being marketed largely to OEMs, mostly in the Far East.

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NEW PRODUCTS

Systems

Scantron Corp. has introduced a portable pen-based computer terminal that allows users to transfer information to a database without requiring any key entry.

Scanscribe was designed with character recognition technology that enables the product to capture data as it is hand-printed on a paper form. The system's ability to define signatures, free-form sketches and diagrams allows its 8½- by 11-in. writing surface to be used for graphics entry.

The product is priced at $2,500.

Scantron
1361 Valencia Ave.
Tustin, Calif. 92680
(714) 259-8887

Model American Computer's *Model 386/25 and 386SX/20MHz offer greater fax capabilities*

Model American Computer Corp. has entered the personal computer market with its recent announcement of a pair of systems that feature a built-in facsimile capability.

The Model 386/25 ($2,495) and the Model 386SX/20MHz ($1,995) both include a built-in fax device capable of sending or receiving data at 9.6K bit/sec. The latter model includes an 80M-byte hard disk, a 3½-in. floppy drive and a two-button mouse. The former model includes desktop and tall versions. Both these versions include 4M bytes of random-access memory, a 120M-byte hard disk and 3½- and 5¼-in. floppy disk drives. All versions include MS-DOS Version 4.01 and Microsoft Corp.'a Windows 3.0.

Model American Computer
233 Needham St.
Newton, Mass. 02164
(617) 969-0093

Development tools

Realia, Inc. has introduced Real370, a personal computer-based, full-screen source-level assembler/debugger.

The product enables programmers to create, assemble and test mainframe assembler programs that were downloaded from a mainframe or created on a PC.

Real370 runs on IBM Personal Computer ATs, Personal System/2s or Intel Corp. 80286-based systems. A license fee costs $995.

Realia
10 S. Riverside Plaza
Chicago, Ill. 60606
(312) 346-0642

Apple Computer, Inc. has introduced an updated version of its Common Lisp development environment that is completely integrated with its Macintosh personal computer platform.

Macintosh Common Lisp 2.0 was designed as an interactive environment for performing object-oriented programming tasks. The product's support of the Common Lisp Object System, an object-oriented extension of Common Lisp, allows users to write portable object-oriented code that can be transferred among other Macintosh systems as well as between different platforms.

System requirements include a Macintosh Plus equipped with a hard disk and 2.5M bytes of random-access memory. A beta-test version is priced at $495, including a free upgrade to the final version.

Apple Computer
20525 Mariani Ave.
Cupertino, Calif. 95014
(408) 996-1010

Caseworks, Inc.'a Case:W Corporate Edition was designed for large-scale advanced Microsoft Corp. Windows programming.

The product supports secondary windows and Multiple Document Interface characteristics such as cascading and tiling of windows. The tool also monitors interface designs to ensure compliance with IBM's Common User Access, the vendor said.

A single-user version is priced at $995, and current Case:W users may upgrade their systems for $200. Case:W Corporate Edition began shipping last month.

Caseworks
1 Dunwoody Park
Atlanta, Ga. 30338
(404) 399-6236

Board-level devices

Dalanco Spry has announced a digital signal processing board that features analog and digital signal I/O for IBM Personal Computer ATs and AT bus compatibles.

The Model 250 is based on the Texas Instruments, Inc. 40-MHz TMS320C25 digital signal processor. It can provide data acquisition for eight single-ended channels at 12-bit resolution and can yield a maximum sampling rate of 250 KHz, according to the vendor.

The board can also be equipped with up to 128K bytes of zero-wait-state program random-access memory and 256K bytes of one-wait-state data RAM.

Pricing begins at $1,095.

Dalanco Spry
89 Westland Ave.
Rochester, N.Y. 14618
(716) 473-3610

Software utilities

Emerald Systems Corp. has announced an entry-level software package designed to perform unattended backup and retrieval of files on a Novell, Inc. network.

Scheduler automatically backs up files from multiple servers, local disks or various combinations of files, paths or directories at a time determined by a network manager.

The product's on-line tree structure maps the history of saved files by date, time and name. Scheduler runs on IBM Personal Computer XTs or Personal System/2s and is priced at $1,295.

Emerald Systems
12230 World Trade Drive
San Diego, Calif. 92128
(619) 673-2161

Best Power Technology, Inc. has announced Checkups, a software package designed to allow two-way communication between an IBM RISC System/6000 running under AIX and a Best Ferrups uninterruptible power supply.

During extended-line power failures, the product automatically triggers AIX routines to save data from memory to disks, close out work in progress and shut down the entire system, the vendor said.

Checkups is available for virtually all computers and operating systems and is priced at $125 or $250, depending on type of platform.

Best Power Technology
P.O. Box 280
Necedah, Wis. 54646
(608) 565-7200

Data storage

Curtis, Inc. has announced a read-only memory disk and drive emulator designed for IBM Personal Computer XTs, ATs or Extended Industry Standard Architecture-based computers.

The Romdisk PCF uses flash technology and Microsoft Corp.'a Flash File System to operate as a write-once, read-many device capable of adding data to the flash memory until it is full. It can erase flash memories at a rate of 4M bytes every 10 seconds and program flash memories at a maximum data transfer rate of 100K byte/sec.

A unit equipped with one flash single LU line memory module (SIMM) is priced at $895, and a device with one static random-access memory SIMM costs $995.

Curtis
2837 N. Fairview Ave.
St. Paul, Minn. 55113
(612) 631-9512

Overland Data, Inc. has introduced an automatic loading, nine-track tape drive designed for personal computer users.

The OD3210 supports 1,600 by 3,200 byte/in. operation. It includes microprocessor-controlled motors that optimize tape tension to ensure accurate reading of even tapes of marginal quality, the company said.

The product also includes a 1M-byte cache buffer and averages 45W of consumption.

The drive costs $4,995.

Overland Data
5600 Kearny Mesa Road
San Diego, Calif. 92111
(619) 571-5555

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FREE GUIDE

HDMS

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BIT BLAST

COS loses president

Corporation for Open Systems, the umbrella organization for U.S.-based standards bodies, is losing its president, chief executive officer and first employee, Lincoln D. Faurer. Faurer, who oversaw COS' initial staffing and expansion since its inception in 1986, will be succeeded by COS Chief Operating Officer Steve Hudson pending approval by the organization's board of directors in May. Faurer will continue to serve COS in an advisory capacity this year.

COS test programs set up to ensure Open Systems Interconnect (OSI)-compliance and interoperability among vendors' products are beginning to see results. AT&T's X.25 Network Interface Release 2.0 was judged OSI-compliant by the COS Mark Program. **Digital Equipment Corp.**'s OSI Conformance and Interoperability Test Center has been accredited as a First Party Test Center under the COS Mark Program. **IBM** and **Unisys Corp.** recently became the first computer firms to register their file-transfer products in the **OSInet Corp.** Test and Registration database. A COS affiliate, OSInet is an association of computer and network vendors and users that supplies OSI test formats.

CC:Mail, Inc. in Mountain View, Calif., announced two programs to entice users to migrate from **3Com Corp.**'s 3+Open Mail to its own local-area network-based electronic mail system. The announcement follows a joint announcement that 3Com will reference sell CC:Mail's system. CC:Mail will provide one free Post Office Pack for MS-DOS for each server version of 3Com mail converted. It will offer a three-for-one trade incentive to any company converting more than 500 3Com mail users to CC:Mail.

Outsourcing may be only answer for many

ANALYSIS

BY GARY H. ANTHES
CW STAFF

The life of the corporate network manager is not getting any easier. Networks are growing rapidly in size, complexity and cost; technical experts are expensive, hard to find and hard to keep; new technologies and new vendors appear at a dizzying rate; and users clamor for more and better service while their bosses demand lower costs.

For network managers confronting these forces, the question may no longer be whether to outsource but what to outsource. There seem to be as many answers to that question as there are companies looking for an answer.

The network outsourcing services market is expected to jump from $1.5 billion in 1989 to $5.6 billion in 1994, according to The Yankee Group in Boston. Dixon Doll, chairman of the DMW Group, a network consulting firm, recently said only 4% of users are outsourcing parts of their network operations today, but by 1995, 15% to 20% of U.S. corporate networks will be managed by outsiders.

The prevailing view among users is that a company can let go of the commodity-like network functions, sometimes called tactical functions. It is possible to save both money and headaches by letting someone else pull wires, provide circuits and move equipment. However, never let vendors get their hands on mission-critical or strategic areas, the reasoning goes. That is too risky, and vendors do not know a company's business like the company does.

Company	Vendor	Description	Main goal
Kodak	DEC	Total network outsource	Reduce cost
Kendall	IBM	Network management	Reduce cost
Chevron	AT&T/Hughes*	Total network outsource	Reduce cost
Wickes	Andersen	Network management	Reduce cost
General Motors	EDS	Total network outsource	Acquisition
Merrill Lynch	MCI	Corporate backbone	Reduce cost
Exxon	AT&T	Point-of-sale network	Availability
Canadian Treasury	DEC	Network management	1-year transition

Source: The Yankee Group

CW Chart: Tom Monahan

Others call that nonsense: Users can outsource anything they want as long as they are careful. Not surprisingly, outsourcing vendors, such as Electronic Data Systems Corp. (EDS), hold that point of view. "Partial outsourcing is a nonsequitur. If you outsource, you do it as much as you can," said Charles Snodgrass, a vice president in EDS' telecommunications services practice. "I'd contend you gain control via outsourcing, not lose control. You can't hold me responsible if you've given me only a piece of the pie."

The tactical-strategic distinction is an arbitrary one anyway, Snodgrass said. "When a tactical circuit goes down, it becomes a strategic circuit."

EDS took total responsibility for the voice and data networks of National Car Rental System, Inc. networks that link thousands of rental and travel agents to National's car inventory and reservation systems.

The real issues are ones of risk and control, not who has day-to-day responsibility for a function. Todd Dagres, director of communications research and consulting at The Yankee Group, said it may make sense to outsource strategic functions — such as management of a mission-critical network — if a few senior people are retained to monitor the performance of the contractor and to do strategic network planning. "Keep a window into the network. Trust but verify," Dagres said.

It is also important to write a contract that allows plenty of flexibility for the customer to

Continued on page 54

USPS automates to lick increase in stamp prices

BY JOANIE M. WEXLER
CW STAFF

MERRIFIELD, Va. — Immersed in a project that puts IBM's System Network Architecture (SNA) on speaking terms with Unix-based personal computers, the U.S. Postal Service is automating its data entry procedures in a move that it hopes will keep the 29 cent stamp steady and holding.

In an effort to reduce operating costs, the postal service is currently about 20 nodes into automating the daily transfer of post office receipts from about 170 post office polling sites to five nationwide data centers housing IBM and Amdahl Corp. mainframes.

The network involves the installation of Intel Corp. 80386-based PCs running Interactive Systems Corp.'s Unix System V Release 3 operating system and Unix-to-SNA connectivity software from Malvern, Pa.-based Rabbit Software Corp. Unix does not easily fit into an SNA environment, requiring conversion software to allow them to intercommunicate.

"We expect to drastically reduce data entry errors and the time necessary to turn around information," said Frank Auger, an automation manager at the postal service's engineering and development center.

Auger said he expects the cuts in data entry turnaround time to result in operational efficiencies and cost savings because of the quicker availability of on-line management information. He added that the system will result "in faster closeout after hours, which should reduce dollars spent in overtime pay."

In addition, the new system will provide speedier tracking of lost items by replacing paper audit trails with electronic ones, Auger continued. "These are cost benefits that could help keep postage prices in check."

The polling centers running the Unix-based PCs gather financial and other data from U.S. post offices each night. The 80386s connect to 2,400-baud modems and poll PCs in the post offices over dial-up analog telephone lines. The Unix machines filter and transmit data to the mainframes, which run SNA protocols.

Direct communication

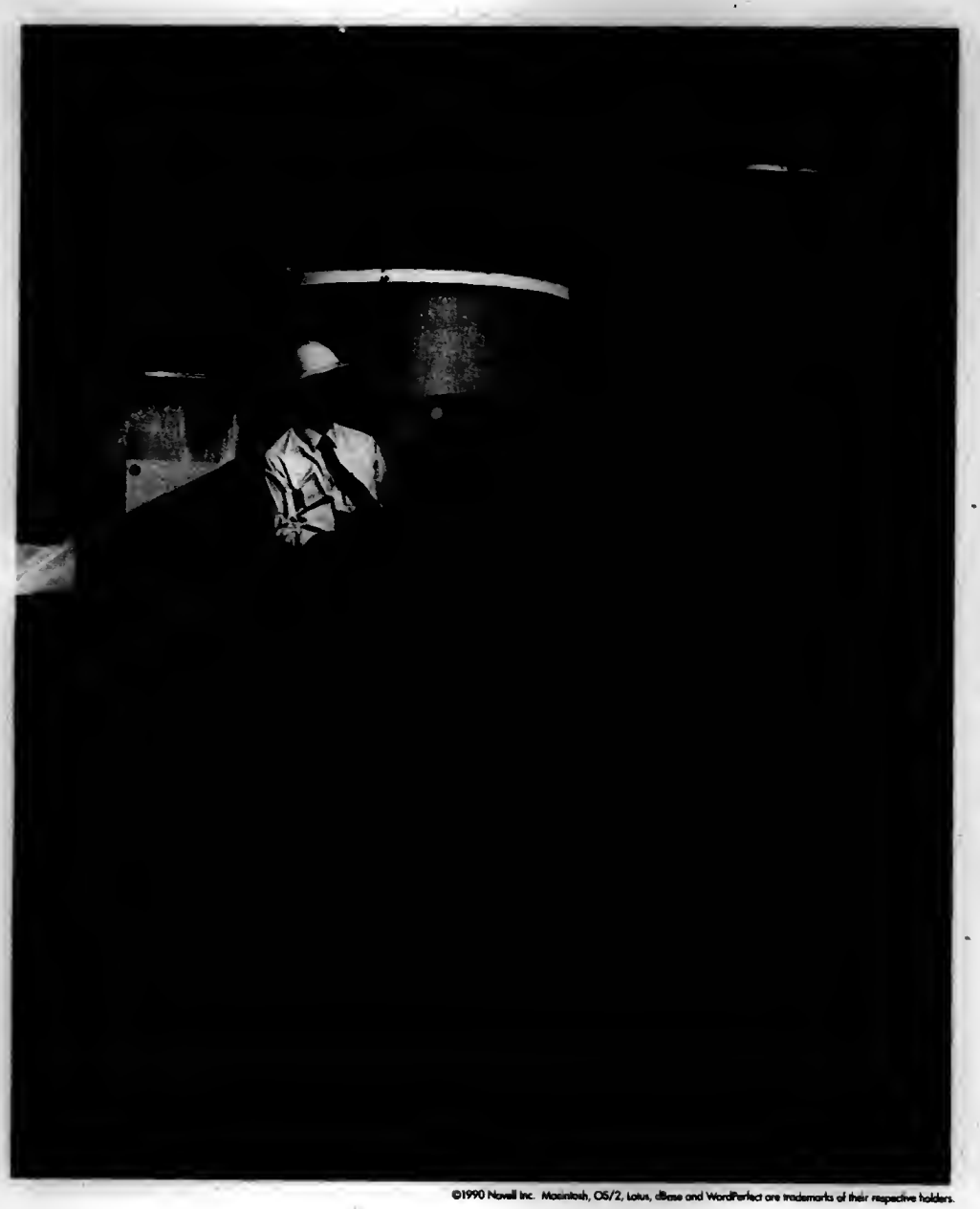
Rabbit's Open Advantage RJE software is allowing the Unix boxes to appear to communicate directly with an IBM mainframe's front-end processor, printers and other devices. Previously, the polling centers sent hard copies of the financial information to the data centers, where it was entered manually into the host computers from IBM terminals.

Equipment in the data centers does not have to be upgraded with the Rabbit software; each 80386 PC in the polling centers requires a gateway card and Rabbit software license, which collectively retail for $1,295.

The pickings for Unix-SNA connectivity software were slim when the postal system scouted out a vendor last year, Auger said. Only Rabbit offered an interface that allows his organization to programmatically control operations, he added.

The percentage of PCs running the Unix operating system is currently under 1%, according to CIMI Corp., a consulting firm in Voorhees, N.J. CIMI president Tom Nolle said he does not expect that number to ever top 10% because of competition among Unix, Microsoft Corp.'s Windows and OS/2 for control of the "power desktop."

NETWARE SOLVES ISSUES AT



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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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Fast-packet capability a concern for T1 users

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Companies with heavy T1 investments and burgeoning data networking applications must examine whether their vendors are offering a plausible migration path to fast-packet technology.

Fast packet represents the latest generation of wide-area switching aimed at supporting such emerging bandwidth-voracious applications as local-area network interconnection, imaging and videoconferencing.

The technology encompasses transmission of variable-length packets (frame relay) and fixed-length packets (cell relay). It blends the desirable traits of its circuit-switching and X.25 packet-switching predecessors, including efficient use of bandwidth, high throughput rates and low network delays.

Most T1 multiplexer vendors have said they will usher their customers into the fast-packet world by upgrading their existing circuit-switching T1 gear. Approaches include fast-packet cards that plug into the T1 multiplexer's bus (Network Equipment Technologies, Inc. and Newbridge Networks, Inc.) and creating a separate fast-packet device that hooks into existing multiplexers (Timeplex, Inc.). The resulting products are intended to support a hybrid circuit/fast-packet architecture.

Time frames for availability of the hybrid products have been fuzzy because vendors — like users — are grappling with the issue of how much they can squeeze out of existing devices before investing in a whole new architecture.

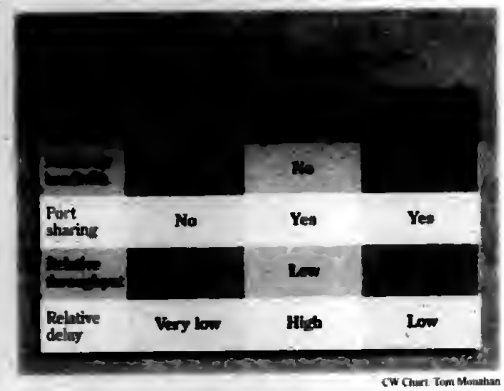
The strategy to patch a fast-packet card onto an existing circuit-switched multiplexer is "a transitional approach that gives users an opportunity to dabble in fast-packet technology," said Steven A. Taylor, president of Distributed Networking Associates in Greensboro, N.C. "But as a higher percentage of traffic becomes data, it may not be sufficient."

Taylor commented that Timeplex's plan to build a whole new fast-packet box "shows chutzpah" on the part of the company. "Timeplex is rightly acknowledging that its 10-year-old Link architecture can't do everything," he said.

Taylor said an advantage with the Timeplex approach is that a stand-alone, fast-packet device can be mixed and matched with other vendors' T1 gear. A disadvantage, he said, is integrating network management of separate devices.

Some users with the luxury of building new networks from the ground up, such as the computer services arm of Stuttgart, Germany-based Daimler-Benz, are deploying switches specifically designed to support fast packet. Currently, Stratacom, Inc. is the only vendor with a commercially installed base of fast-packet T1 multiplexers. Daimler-Benz recently contracted for 14 Stratacom multiplexers.

"With the Stratacom approach, you're clearly putting all your eggs in one basket," commented Dave Passmore, a partner at Ernst & Young in Fairfax, Va. "Without any circuit-switched bandwidth, you no longer have the assurance that particular types of traffic will always get through. You really have to learn how to do your network engineering."



CW Chart: Tom Monahan

Joining the club

Other companies, such as Fedex International Transmission Corp., are preparing for their growing network traffic by investing in multiple vendors' equipment to handle different applications (see story above).

Fast packet's attributes are made possible by the increased intelligence of networked devices and today's highly reliable transmission lines, which allow the elimination of the error detection and correction overhead that bogs down X.25 networks.

Traditional T1 multiplexers support circuit-switched voice and data traffic and allow users to nail up 64K bit/sec. increments of channelized bandwidth up to 1.5M bit/sec. X.25 packet switches improves upon circuit switching by breaking data into packets and dispersing them throughout all 1.5M bit/sec. of available T1 bandwidth to optimize the use of the communications link. However, the variable-frame format of X.25 packets does not make it suitable for voice because of network delays inherent to the packet structure.

A mixed bag

To get the blend of wide-area switching capabilities it needs, Fedex International, a subsidiary of Federal Express Corp. in Memphis, is not relying on a single T1 multiplexer vendor. Last fall, the firm added Netrix Corp. T1 multiplexers to its network of 5-year-old Network Equipment Technologies (NET) gear, creating a hybrid network spanning 26 cities.

NET's IDNX multiplexer currently only supports circuit-switching; Netrix switches combine circuit and packet switching in one box. Netrix has publicly stated that a third switching fabric — frame relay, a fast-packet technology — will eventually be incorporated into the architecture.

Gary Ragsdale, assistant vice president at Fedex, said the dual-vendor solution should satisfy Fedex's needs for two to three years. "We chose Netrix to solve an immediate problem of upgrading our custom-built packet switches because our software maintenance costs became unwieldy," he said.

The frame-relay support of the Netrix equipment is important, Ragsdale said, because "one of our primary concerns is to boost inter-LAN traffic above the 56K bit/sec. barrier."

JOANIE M. WEXLER

Outsourcing

FROM PAGE 51

make network upgrades as technology changes and one with performance metrics and vendor penalties in case problems occur, Dagres said.

Outsourcing does not have to mean giving up something on a permanent basis. The problems that suggest outsourcing, such as rising costs and personnel shortages, may be solved by one-time consulting or engineering engagements by networking experts.

Taking it slow

One way for a company to take a partial step down the outsourcing path is to give the vendor its network during second and third shifts and weekends while keeping control over the more critical prime time. As confidence in the vendor grows, more can be outsourced.

Melbourne, Fla.-based Harris Corp. outsourced its worldwide voice networks to MCI Communications Corp. but held on to management of its data communications. "We're very happy with MCI. It's a lot easier now," said Jim Odom, manager of network tools at Harris.

"But our data communications is very application dependent, with different applications using different protocols. The vendor doesn't understand our applications and doesn't understand the criticality when a circuit goes down," he said.

Odom said when data networks become as standardized as voice networks, it may be time for companies to look at outsourcing again.

Companies wondering what to outsource might look at their local-area networks, Dagres said. Most outsourcing vendors concentrate on wide-area networks and companies often overlook LAN outsourcing because LANs are not controlled centrally within the company nor is their cost accurately measured.

No matter what, a prudent company will carefully weigh its network outsourcing options. "You have to demonstrate you've entertained the possibility, or you'll be asked embarrassing questions you can't answer," said John J. Reis, president of International Telemanagement.

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VXM finds way to Balans multivendor tasks

Offers software first to provide load balancing across distributed networks

BY ELISABETH HORWITT
CW STAFF

BOSTON — VXM Technologies, Inc. has reportedly beaten industry leaders to the punch in providing a way to allocate and load balance tasks across a multivendor distributed computing network.

VXM's Balans software package will perform the above tasks across a variety of distributed computing platforms, including Sun Microsystems, Inc.'s Open Network Computing (ONC), the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) and Hewlett-Packard Co.'s Network Computing System (NCS), according to VXM President Franco Vitaliano.

NCS and DCE are technically equivalent since the OSF recently adopted NCS as the basis of its environment, he added.

Balans works with mapping and naming services such as Sun's Network Information Service and HP's Task Broker, which keep track of which services and computing resources are available on different systems, Vitaliano said.

As a result, applications that support Balans can transparently initiate tasks on various networked servers without having to designate the server's location or worry about whether the said server supports NCS, DCE or ONC, Vitaliano said.

Mapping provided

If an ONC client needs to access an NCS server, for example, Balans will provide the necessary mapping and translation to accomplish this. If a client application happens to support ONC, but wants to access an NCS, Balans will automatically map its request to an NCS-DCE naming/location service, he added.

Balans is also said to balance application loads across different servers, taking into account the comparative power of different CPUs and changing work loads.

Balans' ability to "glue Sun and DCE-NCS networks" into one distributed computing system is of great potential value to investment companies that are currently eyeing distributed computing as a way to set up applications for new products more quickly, according to Steve Levy, a former vice president at Boston-based investment firm The Putnam Cos. Levy helped develop a distributed computing platform at Putnam and recently started The MacGregor Group, a software company that will develop and implement similar platforms to investment company.

One concern Levy voiced, however, was the amount of work it takes to migrate existing applications to Balans. While the program is written in C, "you would still have to rewrite portions of applications" to support Balans, he added.

Levy described Balans as an advanced version of HP's Task Broker, a software offering that allocates jobs across a network of HP Unix systems. HP recently announced it is porting Task Broker to Sun systems in cooperation with Science Applications International Corp.

Unlike Balans, however, Task Broker does not hook into distributed computing systems such as NCS that allocate a given job among several computers, said HP spokesman Marc Lederhos. Instead, Task Broker determines which of several Unix-based systems should get the whole job. It was also designed for engineering work group networks of up to 30 or 40 nodes, not for extensive, enterprisewide sytems, Lederhos said.

Balans' first user site, Iowa State University, plans to use the product to automatically allocate and administrate system resources across Sun, HP and Digital Equipment Corp. Ultrix-based machines, the university said in a prepared statement. The installation will eventually incorporate 1,000 nodes, Iowa State added.

When it comes out in the third quarter of this year, Balans is scheduled to support Sun's Scalable Processor Architecture and DEC Ultrix workstations. VXM plans to migrate the system to DEC VMS systems by the fourth quarter of this year and to IBM MVS systems by the first quarter of next year.

The program will also support the Network Queueing System, a software package that distributes batch jobs across a network. Originally developed for the National Aeronautics and Space Administration, the system is expected to become a Posix standard, Vitaliano said.

Pricing for Balans was not available.

BALANS BALANCES applications loads across different servers, taking into account the comparative power of different CPUs and changing work loads.

Radio network developers target IBM mainframe links

BY MICHAEL FITZGERALD
CW STAFF

LINCOLNSHIRE, Ill. — Ardis, a partnership of IBM and Motorola, Inc., and CAP Gemini America have agreed to jointly develop an LU6.2 interface link between radio-based networks and IBM 3090 and Enterprise System/9000 mainframes. The move was given qualified praise by analysts as one that may make it easier for users to switch applications to radio data networks such as Advanced Radio Data Information Service (Ardis).

Currently, Ardis users must develop their own interfaces between their mainframes and the handheld radio network.

Alan Reiter, executive editor of the newsletter "Mobile Data Report" in Washington, D.C., said the interface was not going to ignite interest in radio data networks. "From a mobile data standpoint, this is just one of many, many pieces of trying to sell mobile data communications," Reiter said.

Users were equally reserved.

"It could be [useful]," said Tivadar (Max) Macskassy, manager of network and communications at Maersk Data, a Madison, N.J.-based subsidiary of Maersk, Inc. Having CICS connections through LU6.2 may not be as relevant, because distributed computing de-emphasizes the mainframe, Macskassy said.

This is "a very reasonable thing" for Ardis to do, said Joseph Baylock, program director at Gartner Group, Inc. in Stamford, Conn., while agreeing that the interface is one of many things Ardis needs to do. "To the extent the market at large is going to LU6.2, you want to be able to talk to your field force automation applications on the same basis," Baylock said.

Although no Ardis customers have asked for such an interface, Ardis said it believes that developing the interface will put it "in front of demand," said Barbara Wagner, an Ardis spokeswoman. The interface should ship by mid-April.

New York Life Insurance Co., an early Ardis pilot program, decided not to use Ardis to give 10,000 agents access to mainframes.. The firm wanted to ship 40,000-character files, which cannot be handled by the network.

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NEW PRODUCTS

Network management

General Datacomm, Inc. has announced a DOS-based software package designed to support up to 256 network elements while running on an IBM Personal Computer AT or compatible.

The Netcon Small System Controller includes four serial ports for carrying diagnostic data, and a multitasking capability allows management routines to remain uninterrupted while continuous background surveillance is performed and while an operator configures the network, the vendor said.

The product is priced at $7,500.

General Datacomm
Middlebury, Conn. 06762
(203) 574-1118

Newport Systems Solutions, Inc. has unveiled a data compression enhancement package designed for Novell, Inc.'a Netware Link/64 and Link/T1 products.

A proprietary algorithm provides an average data compression ratio of 4:1, according to the vendor. The data compression enhancement is said to enable 9.6K bit/sec. lines to yield bandwidths of 38.4K bit/sec. or higher and 128K bit/sec. lines to yield bandwidth up to 512K bit/sec.

The product is priced at $1,595.

Newport Systems Solutions
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

Local-area networking hardware

Xerox Corp. has announced an integrated facsimile server that enables users of Novell, Inc. local-area networks to send and receive faxes directly at personal computers or workstations.

The Xerox Lan/Fax Express 21 comprises a Xerox telecopier 7021 plain-paper fax terminal and hardware accessory and software. The product enables users to fax computer-generated documents from a pop-up window without having to exit from the application, according to the vendor.

Other features include more than 350 fonts and support for Hewlett-Packard Co.'a Laserjet PCL page description language.

The product is priced at $6,995.

Xerox
Xerox Square
Rochester, N.Y. 14644
(716) 423-5090

Softnet, Inc. has announced a server that enables users of personal computer-based local-area networks to share a single intelligent facsimile board.

Sharefax Version 2.11 allows users to send data to a fax machine via a command line or a 27K-byte terminate-and-stay-resident (TSR) utility. The product includes hot keys that are said to enable users to access a fax machine while remaining within other applications.

A 50K-byte TSR utility can be used for faxing multiple files to one or more fax machines. The product also allows users to delete names from a fax log at the fax server. Fax transmissions can also be scheduled for later in the day when telephone line charges drop.

Pricing is $795 per server, regardless of the number of workstations.

Softnet
775 Franklin Road
Marietta, Ga. 30067
(404) 499-0007

Micro-to-host

Teamwrite Corp. has introduced a Microsoft Corp. Windows 3.0-based interface program designed for personal computers connected to IBM Application System/400s, System/34s, 36s or 38s.

SAA/Vision-400 allows host-generated screens to be styled to the Windows environment without requiring any changes to the host. Instead, host screens can be captured and stylized later in off-line mode, the vendor said.

Other features include support for multisessions in separate windows, 132-character support, mouse selection of input fields and automatic font resizing.

The product is scheduled to begin shipping next month. A basic program is priced at $199 per PC. A developer's kit that includes an on-line screen styling module costs $799 per PC.

Teamwrite
1403 N. Batavia St.
Orange, Calif. 92667
(714) 744-1496

Software Corp. of America, Inc. has announced an IBM Presentation Manager-based communications product designed to assist users in building connectivity workstations.

Talkthru for OS/2 ($350) supports asynchronous communications and IBM's Extended High Level Language Application Programming Interface in an OS/2 environment. It also features terminal emulation for asynchronous protocols and will operate with coaxial, asynchronous or networked devices.

Talkthru for OS/2 runs on an IBM Personal Computer XT, AT, Personal System/2 or compatible running OS/2 Standard or Extended Editions.

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- 3270 EMULATION—CQ Computer Communications; NSA; Attachmate; Black Box; Sterling Software
- 5250 EMULATION—CQ Computer Communications; Black Box; Emerald
- X.25—Microdyne; NSA
- UNIX, XENIX, AIX—The Santa Cruz Operation; Cleo; Serengeti Software
- REMOTE JOB ENTRY—CQ Computer Communications; Serengeti Software; Eastham Assoc.; Sterling Software; Barr Systems; NSA; Black Box; Cleo
- APPC/LU6.2—NSA

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MANAGER'S JOURNAL

EXECUTIVE TRACK

David L. Gaugler has been named director of the Systems Management Division at the **U.S. Internal Revenue Service** in Washington, D.C.

He is responsible for assistance on new technologies; monitoring regional, district and service center computer systems; capacity management; systems software; and data administration.

Gaugler had been assistant director of the IRS Martinsburg, W. Va., Computing Center since 1989.

He began his IRS career in 1967 in Washington and has held information systems positions in Fresno, Calif., Philadelphia and Dallas.

Gaugler holds a bachelor's degree in mathematics from Muhlenberg College and a master's degree in industrial engineering and computer science from Stanford University.

.....

Mark H. Breedlove has been appointed president and general manager at the **Allied-Signal, Inc. Automotive Certified Brakes Division** in Toronto.

Breedlove was formerly director of manufacturing logistics and IS at the Allied-Signal Autolite group in Fostoria, Ohio.

He joined Allied-Signal in 1979 in the financial operations of the Bendix Automotive Systems Group in Southfield, Mich. He joined Autolite in 1986.

.....

John R. Reese, former director of corporate communications and office automation at First City Bancorp, was named vice president and general manager at **Teleport Communications Group's** Houston office.

Teleport, based in Staten Island, N.Y., provides private-line voice, data, video and other telecommunications services.

At First City Bank, Reese helped negotiate a 10-year outsourcing contract with Electronic Data Systems Corp. He then joined EDS as telecommunications manager with responsibility for managing telecommunications networks and services at First City Bank.

Casual clothes, serious systems

Wrangler CEO Mackey McDonald has weighty things to say about IS in his business

BY CLINTON WILDER
CW STAFF

Blue jeans might not sound like a high-technology business, but don't tell that to Wrangler's president and chief executive officer, Mackey J. McDonald. Belying the casualness of both his product and his friendly Carolina drawl, McDonald is dead serious about the critical role of information systems in the rapidly changing apparel business.

Greensboro, N.C.-based Wrangler, a division of $2.6 billion VF Corp., in many ways represents a microcosm of fundamental changes that have hit many U.S. manufacturing industries. Where once it thrived on efficient manufacturing of commodity goods for mass markets, Wrangler must now cope with fickle consumer needs and new competition for retail shelf space.

McDonald, 44, joined Wrangler at the height of these fundamental changes in 1986 as executive vice president and was named president and CEO in 1988.

Although Wrangler has made great strides in using IS to enable business change, McDonald says he feels that the apparel and retail industries are far from where they should be in reaping technology benefits. McDonald has many other insights into applying technology to a rapidly changing business:

• **On learning the importance of IS:** McDonald says he became aware of IS' value "primarily through not having enough information and making huge mistakes as a result of that — putting products out that didn't work, having inventories that were out of control. Because that was so normal in our industry, it just was almost accepted.

Continued on page 62

THE CEO VIEW

City Business

Wrangler

The man: *Mackey J. McDonald, 44; B.A., prelaw, Davidson College; MBA, marketing, Georgia State University*

The career: *President and CEO of Wrangler, 1988-present. Also group vice president of parent VF Corp. with responsibility for Health-tex division. Executive vice president, Wrangler, 1986-88. President of former Troutman division of VF, 1984-86. Vice president of Lee division of VF, 1983-84*

Accomplishments: *Reduced Wrangler product cycle times by 30%; reduced some production lead times from one week to one day; implemented daily retail point-of-sale data capture for more accurate stock replenishment*

Business and technology goals: *Continue to diversify product line; reduce product cycle times by 50%; extend EDI links to more retailers*

U.S. business still follows the paper trail

BY JIM NASH
CW STAFF

There is a bald mountain somewhere in Oregon dedicated to all the memos that computers were supposed to replace with electronic documents.

Without a doubt, paper-based communications are slowly being converted to electronic code. But despite all the advances in imaging and electronic data interchange technology, it is impossible to tell if the conversion rate will ever match the growth rate of paper use.

Roberta Jackson, president of the Boston chapter of the Association of Records Managers and Administrators, said the paper industry predicts a 20% increase in the use of paper by the year 2000.

Jackson said that electrons carry only 5% of all business information in the U.S., while 10 times that percentage could and should be imaged for electronic distribution and storage.

However, more than mere fondness for file cabinets keeps executives printing their correspondence. There is the satisfaction of getting or giving commendations on smooth, tangible paper, Jackson said. Congratulatory notes via electronic mail do not seem to cut it.

On the other hand, walking papers continue to be just that. According to Jackson, managers dealing with personnel matters show about the most resistance to electronic communication.

On a more concrete plane, judges and state regulators consider paper documents the "best evidence," she explained. For this reason, technology may even end up giving paper renewed life.

In an age when photographs, video and film can be very convincingly altered, the legal and government worlds are becoming increasingly suspicious of electronic documents stored on floppy disks, tapes and hard disks.

Responding to this continued insecurity, managers are more likely to store more documents in larger and larger warehouses as backups to their electronic cousins, Jackson said.

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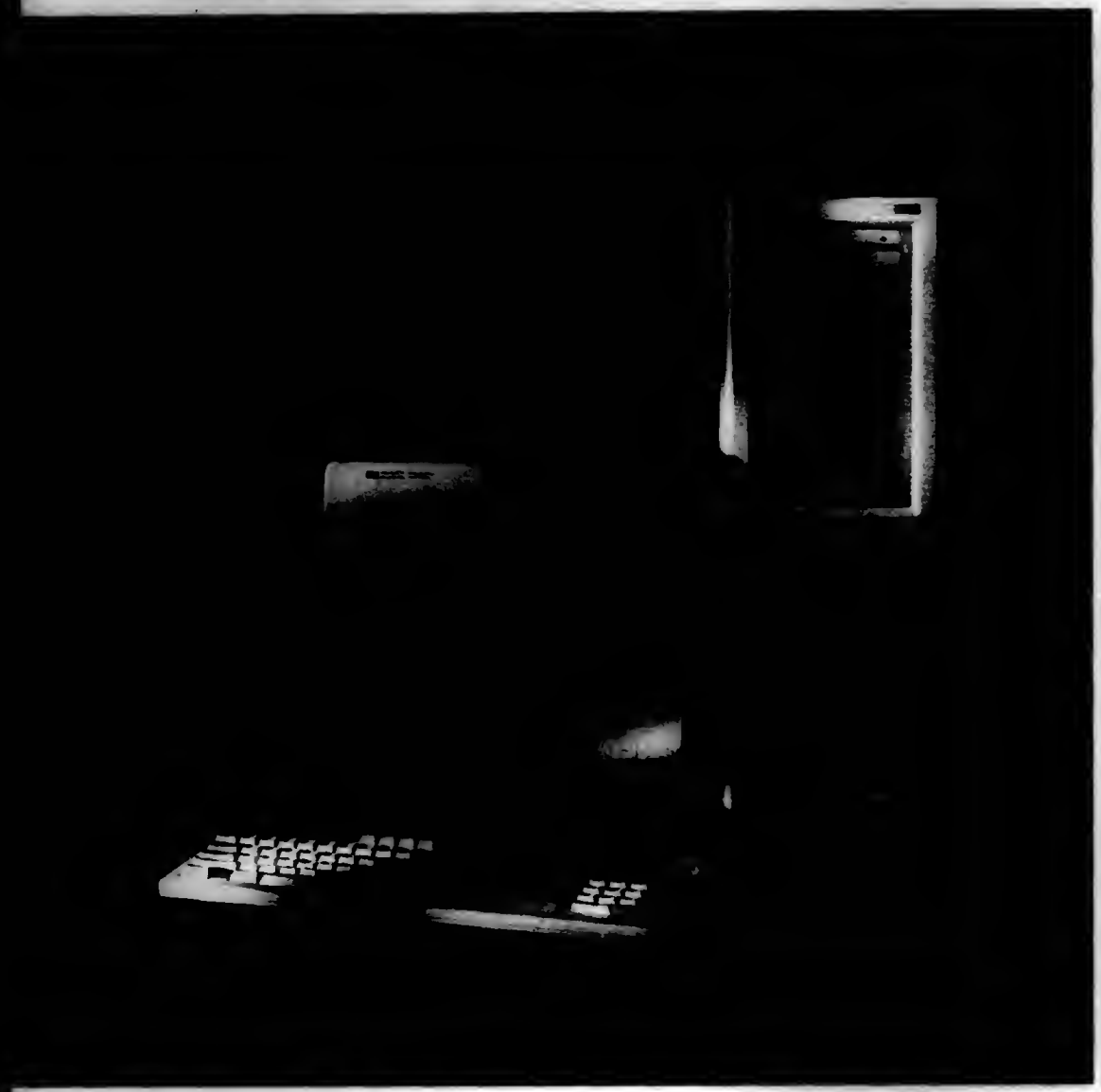

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[1]Computerworld, 11/2/90. [2]PC Magazine, 9/25/90. [3]Warranty applies to HP Vectra 486/25T and 486/33T PCs. Warranty offer available only in U.S. and Canada. © 1991 Hewlett Packard Company CPPC012

Outsourcing at Southland: Best of times, worst of times

BY JOHANNA AMBROSIO
CW STAFF

DALLAS — Elliot McNeill's tale of outsourcing is the classic good news/bad news story. The good news is that McNeill, MIS manager at The Southland Corp., is getting good service and saving money. But getting there has not been easy, and some problems — billing and disaster recovery, among them — remain.

"Would I do it again?" McNeill asked. "Intellectually, I'd say no. But if I went back to 1988, and the circumstances were the same, yes, I would."

McNeill shared his experiences at a recent forum hosted by accounting and consulting firm Deloitte & Touche.

In 1988, McNeill recalled, Southland's chief executive officer became enamored of the outsourcing option after the company had completed a leveraged buyout resulting in a huge debt. "We had to downsize very quickly, and we were in cash-conscious mode," McNeill said.

On Jan. 1, 1989, Southland, the $8 billion operator of 7-Eleven stores, began its 10-year outsourcing contract with then-start-up Affiliated Computer Services, Inc. (ACS) based here. In exchange for low-priced processing services, Southland essentially gave its data center to ACS, providing the vendor with capacity to sell services to other customers.

"We contributed two CPUs — an Amdahl Corp. 5580 and an IBM 3090 — a satellite earth station and 96 computer operations employees," McNeill said. Southland also leased to ACS an 11-story building that housed the data center.

"We didn't have to move anything, and they gave us a break in pricing," McNeill said. At the time, ACS was a very small operation. "We were their second client," he noted.

Cultural tug of war

The first year of the relationship was a tug of war, McNeill recalled. "There were two company cultures with mixed data and mixed standards, and it was a challenge to everyone." But in 1990, "we got excellent service and still do; now, we're very pleased. But if you had asked me to speak here two years ago, I don't know if I would have," he added.

Some problems remain, however, and among them are sticky issues related to billing. Southland is charged by CPU hours, tape mounts, direct-access storage device use and lines of print. There are also fixed charges for terminals and communications equipment.

"The problem is that you can run the same job with the same input at two different times and get two different charges for it," McNeill said. "That's been a problem at our company."

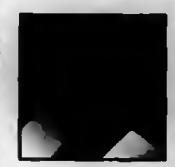
Another issue concerns disaster recovery. "Because ACS was such a small company, we still haven't had a satisfactory disaster recovery test. We're hoping to fix that next month," he added.

The cost savings are difficult to pin down. In 1988, McNeill said, Southland spent $13.2 million on information systems; in 1990, that figure was $10.8 million. "But we don't know for sure which part of that reduction was caused directly by outsourcing," he said. "We might have been spending less anyway due to our downsizing. It's hard to say."

Since its leveraged buyout, Southland has also undergone Chapter 11 bankruptcy protection and is now majority-owned by its Japanese affiliate, 7-Eleven Japan.

One result of the outsourcing is that Southland is "focused on cost," McNeill said. "It's like the electric company; you use less, you pay less." Still, he added, "I'm held accountable for every uptick in the bill."

Another problem is that "you lose control of technology and timing of upgrades," McNeill said. "And you lose the direct contact with vendors."



Nevertheless, he said, Southland retains firm control of its strategic direction in IS. McNeill's in-house staff of 99 still does applications development and manages the relationship with ACS.

"When they're not performing, it's my duty to bring that to their attention," McNeill said. "And it's still our responsibility to keep up with technology trends. It's not in the vendor's best interests to tell us about trends like PC-based computer-aided software engineering because it takes cycles off the mainframe."

McNeill advised anyone considering outsourcing to "make sure you have very specific performance criteria for the vendor to live up to and performance remedies if he doesn't. Also, make sure that in the contract you have something very specific to be billed on."

Furthermore, he said, "be very careful that this is what you want to do because you can't go home again. If you decide you don't like it, you've already given up your technical employees and software licenses, and you don't have a data center anymore. It's not as easy to get out of as a marriage."

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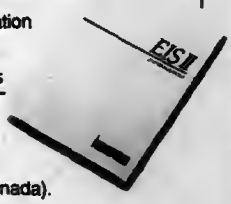

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Wrangler

FROM PAGE 59

So I began to realize that without the information systems that you need, you cannot manage a business — particularly when you're trying to make major changes in the business."

• On how IS can enable change in business processes:

"Instead of just shipping inventory into retailers, we had to focus on what happens to the products once they get on the shelf. That meant we had to have continual feedback about what was happening there, and we basically didn't have any at all. In many cases, our retailers didn't have a lot either.

"So we've really been working hard on our EDI linkage to the retailers. But it's not just linking up — it's being able to change our manufacturing system so that we could respond to sales of products that took off, or cut back our production when products weren't selling quickly. We have a satellite dish on top of our building where we receive daily sales information from Wal-Mart and other customers like that. We can automatically generate orders based on that, and we have the Quick Response capabilities in manufacturing to be able to ship out those goods in a couple of days."

• On re-engineering manufacturing for Quick Response:

"That was the most difficult thing we went through. This whole idea of quick change, flexibility and producing different types of products was foreign to what we were good at. We had to not only implement a lot of new systems, we also had to change the mind-set of a lot of the manufacturing people. Actually, it was the mind-set of the whole company. We'd had some very profitable years, and the need for change wasn't seen by a lot of people."

• On implementing flexible systems:

"In a meeting in 1989 to discuss the new product development and manufacturing system, one manufacturing manager said, 'We can be as flexible as you want. All you have to do is tell us far enough ahead what you need and then stick to it.'

"My first reaction was, why did I have to be surrounded by bullheaded managers? But I realized it was my bullheadedness that was preventing me from seeing a key truth. The old system could not handle diversity because you did not have enough information about what type of product was needed and in what quantity. Schedules and product lines were continually changed with processes that were not designed for flexibility."

Chip Henderson

"I DON'T SEE HOW A company that is not moving extremely fast in information systems is going to survive."

Mackey J. McDonald
President and CEO
Wrangler

• On the progress of IS in the apparel industry:

"The apparel industry has a long way to go. We do far too much in this industry in just testing the waters, just putting products out there and hoping that somebody will buy them. The public goes in and either buys them because there's nothing else available, or they just turn up their noses and walk away, and then we've got huge inventories of nonproductive products. You need to know what's happening as soon as you put a product out there, so you can go into full production on it or just scrap it and go on to the next one.

"The ability to tie the retailer's and manufacturer's systems together and really control the right inventory out there is going to sort out the winners and losers in the next five to 10 years. There will be a lot of people who can't do it and won't survive."

• On the blending of IS into business units:

"Each of our strategic business units, like our Western or Rustler clothing lines, has a team to decide what it's going to take to be successful in their business. They have IS, manufacturing and marketing people, and they are given certain parameters — resources you can use, objectives you have to hit — but *you* decide how to run the business.

"So the people down in the IS group are really senior staff members in that particular business unit. They have a lot of decision-making power."

• On IS staff members as change agents:

"A big reason why we have moved as fast as we have is the mind-set of the IS people. They don't look at their job as, 'I do this over here; I do the programming.' They feel their job is to understand the business needs and present ways that we can address those business needs.

"Overall, I feel that our IS people had very good foresight as to what was necessary to change. They had a good external focus and were probably as aggressive as any group in our company at making those changes."

• On IS reporting to the CEO:

Wrangler's vice president of IS, Jeff Kernodle, formerly reported to the chief financial officer. "I moved him to be under me . . . and I need him. I don't see how a company that is not moving extremely fast in information systems is going to survive. I really don't."

A TOAST TO THE SWEDISH S

CALENDAR

Harvard University's Kennedy School of Government professor and noted author Robert B. Reich will be the keynote speaker at the Assist 1991 Conference for users of Andersen Consulting software. The conference will be held April 28-May 1 at the Westin Peachtree Plaza Hotel in Atlanta.

Reich is the author of the recently published *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. The conference theme is "Solutions and Strategies through Communication."

For more information or to register, contact Assist headquarters, 401 North Michigan Ave., Chicago, Ill. 60611, or call (312) 644-6610.

APRIL 14-20

Congress on CIM Databases. Cambridge, Mass., April 14-17 — Contact: Wilma A. Harwitz, CAD/CIM Alert, Boston, Mass. (617) 232-8080.

International Technical Communication Conference. New York, April 14-17 — Contact: ITCC, Thornwood, N.Y. (914) 742-5999.

Information User Association Architecting for the '90s. Salt Lake City, April 14-18 — Contact: IUA Headquarters, Chicago, Ill. (312) 644-6610.

Nastec 3.0. Atlanta, April 14-19 — Contact: Dave Cochrane, National System Programmers Association, Milwaukee, Wis. (414) 423-2420.

Canton Users' Exchange. Baltimore, April 15 — Contact: Ron Block, CUE, New York, N.Y. (212) 633-5080.

Cardtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Knowledgeware International User Conference. Atlanta, April 15-17 — Contact: Knowledgeware, Inc., Atlanta, Ga. (404) 231-8575.

Semtech '91. Crystal City, Va., April 15-17 — Contact: American Electronics Association, Santa Clara, Calif. (408) 987-4256.

Wireless Data Networks Conference. Washington, D.C., April 15-17 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Lap & Palmtop '91. New York, April 16-17 — Contact: Peter O'Connor, Laptop Expositions, New York, N.Y. (212) 682-7968.

Downsizing Conference: Moving from Mainframes to PCs. Boston, April 16-17 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Electro/International. New York, April 16-19 — Contact: Alexis Bierwich, Electro/International, Los Angeles, Calif. (213) 215-3976.

IBM User Group Europe Conference. Paris, April 17-19 — Contact: Karen G. Mendez (713) 782-6080.

Instore Systems: The Key to Better Customer Service. Orlando, Fla., April 17-19 — Contact: National Retail Federation, New York, N.Y. (212) 563-5113.

International Conference on the Application of Manufacturing Technologies. Alexandria, Va., April 17-19 — Contact: Lynn Boston, The Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

World Computer Law Congress. Los Angeles, April 18-20 — Contact: Michael D. Scott, Center for Computer Law, Manhattan Beach, Calif. (213) 689-5186.

APRIL 21-27

Adapso Management Conference. Miami, April 21-24 — Contact: Adapso Education Department, Arlington, Va. (703) 284-5302.

Electronic Funds Transfer Association Convention. Nashville, April 21-24 — Contact: EFTA, Alexandria, Va. (703) 548-9800.

Software Maintenance Annual Meeting & Conference. Philadelphia, April 21-24 — Contact: Robin Gross (707) 643-4423.

Computer Law Conference. Washington, D.C., April 22-23 — Contact: Barbara Fleser, Computer Law Association, Fairfax, Va. (703) 560-7747.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., April 22-23 — Contact: Decision Support Technology, Cambridge, Mass. (617) 354-6400.

APICS 1991 Manufacturing Principles and Practices Seminar. Orlando, Fla., April 23-24 — Contact: APICS, Falls Church, Va. (703) 237-8344.

Reverse Engineering Forum. St. Louis, April 23-24 — Contact: Dawn Skaggs, Washington University, St. Louis, Mo. (314) 889-4556.

Unix Today. Atlanta, April 23-24 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

NCGA '91. Chicago, April 22-25 — Contact: Steven Sutton, National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Unix C++. Washington, D.C., April 22-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

International Tools and Techniques Conference. Boston, April 22-26 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

Common Spring 1991 Conference. Las Vegas, April 22-26 — Contact: Common, Chicago, Ill. (312) 644-6610

Uno, Inc.'s Spring Conference. Chicago, April 22-26 — Contact: Uno, Inc., Bladensburg, Md. (301) 699-2336.

Integrated Call Processing '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

Speech Tech '91. New York, April 23-25 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

EDI '91. Orlando, Fla., April 24-26 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

Interexec '91. Miami, April 25-26 — Contact: Letcom Events Coordinator, Letcom, Inc., Coral Gables, Fla. (305) 446-5150.

APRIL 28-MAY 4

Books & Bytes User Group Conference. San Jose, Calif., April 29-May 1 — Contact: BBUG '91, Sunnyvale, Calif. (408) 720-0231.

Human Resource Systems Professionals Conference. Chicago, April 29-May 1 — Contact: The Association of Human Resource Systems Professionals, Dallas, Texas (214) 661-3727.

Focus Users Group '91. Anaheim, Calif., April 28-May 3 — Contact: Rosemary Moore, Focus, Inc., Marlboro, N.J. (201) 780-2185.

Organizing and Managing the IS Business. Southbury, Conn., April 28-May 3 — Contact: Polytechnic University Seminar Program Office, Hawthorne, N.Y. (914) 347-6940.

Downsizing the Corporate Information Systems. London, April 29-30 — Contact: Boston Systems Group, Boston, Mass. (617) 423-1670.

Association for Information and Image Management Show and Conference. Washington, D.C., April 29-May 2 — Contact: AIIM, Silver Spring, Md. (301) 587-8202.

ISA Education '91 Spring Symposium. Edmonton, Alberta, April 29-May 3 — Contact: Ian Verhappen, Committee General Chairman, Edmonton, Alberta (403) 790-7917.

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SOFTWARE MAINTENANCE

Don't chase problems; control them

BY GEOFFREY BARNES and BILL DECHERD

Getting a handle on software maintenance can be like trying to herd lizards with a stick: While you're off chasing the most immediate problem, others crop up demanding as much or more attention. To top it all off, every now and then one of those lizards turns into an alligator.

Most information systems groups would like to get beyond the frenzy of finding bugs, updating applications and fixing systems failures to make fundamental, long-term changes to the systems that would ultimately afford them greater control over these more reactive tasks.

The catch-22 is that the daily problems are so consuming, it's difficult to get to the larger picture. Fortunately, there are tools that help automate both reactive and what could be called "active" maintenance.

In reactive maintenance, the staff is responding to a problem. Here, such tools as testers and debuggers can help (see story page 66).

Active maintenance is more controlled. The staff analyzes and updates applications in response to the changing needs of the enterprise, and changes are made while the system is stable.

The tools that enable an active maintenance approach go hand in hand with one of today's most popular buzzwords: re-engineering. Re-engineering can refer to a wide range of maintenance tools, from the simple, such as those that restructure code for readability, to the complex, such as those that move existing applications onto a new platform (see story page 68).

Simple or complex, several tools help maintainers analyze programs and understand how they interact systemwide.

Barnes is director of business solutions development at CAP Gemini America's National Re-engineering Practice. Decherd is national project support manager at the firm.

Static complexity analysis tools analyze programs in batch mode without intervening or interacting with the code.

Some of these, such as Analysis of Complexity Tool, which is a part of Battlemap from McCabe & Associates in Columbia, Md., can produce a graphical representation of a program's control flow. A personal computer version is priced at $6,500.

Some static analysis tools use metrics formulas to analyze program complexity. These tools calculate the complexity metrics, point out areas of the source program that might be subject to error and make recommendations for improving the program.

One such analysis tool is Pathvu from XA Systems Corp. Priced from $29,000 to $55,000, Pathvu can also make suggestions for breaking a large program into smaller modules.

Finding structure

Output from a metrics-based analysis tool can help maintainers restructure complex programs to ultimately improve their readability, but this does not have to be a manual process.

Restructuring tools actually interact with the code, transforming spaghetti code into a respectable structured program. They do this by analyzing a program's control structure and imposing a structure in which routines have only one entry and exit point.

Such tools include Recoder ($90,000) from Language Technology, Inc. in Salem, Mass.; Superstructure ($28,000 to $45,000) from Computer Data Systems, Inc. in Rockville, Md.; and Retrofit ($55,000 to $103,000) from XA Systems.

Linda Black

Users need to be cautious when selecting restructuring tools, however, because different tools can produce radically different results.

It's also important to remember that there are two aspects to a "structured" program: modularity and structure. Automated tools deal with structure better than they deal with modularity.

Watch how it works

Sometimes, the best way to understand how a program works is to use an interactive code analyzer to watch it in action.

One example is Via/Insight ($57,000 to $89,000) from Viasoft, Inc. in Phoenix. This tool allows a programmer to trace program execution flow while looking at the source code on an ISPF screen.

The effects of a change on various data elements can be quickly verified. The tool can be sensitized to a particular item, stopping the trace only when that data item is referenced or modified. If an unusual condition is encountered, Via/Insight can trace the logic flow backward to locate the anomaly.

Smartsystem from Procase Corp. in Santa Clara, Calif., does much the same thing for Unix and C users. It's priced between $1,750 and $8,750.

Similar capabilities on PCs are available with Micro Focus Cobol/2 Workbench ($3,290) from Micro Focus, Inc. This analysis and debugging workstation can simulate IBM mainframe environments.

But no matter how well-

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INSIDE

Product Guide
A comprehensive listing of code-analyzing tools. Page 67.

Reining in Costs
A variety of tools can predict maintenance costs. Page 69.

Buyers' Scorecard
Realia tops user ratings of PC-based Cobol compilers. Page 70.

Continued from page 65

structured a program is, many maintainers have trouble locating the best place to make a needed program change. The problem is often not only where to put a change in the program, but also *which* program to change.

Because maintenance changes usually affect existing data elements, the placement of changes often depends on where else the affected data element is referenced or modified. It is important to understand how a change is going to affect data elements throughout the application.

A cross-reference tool can show where each data element is referenced. One such tool is X-Ref ($4,000) from National Database Software, Inc. in West Bloomfield, Mich. Cross-references generated with such a tool are usually easier to use than the normal compiler-generated ones because the references for each data element appear opposite the element definition in the source listing.

Systemwide cross-reference information can be obtained from tools that scan entire libraries and provide reports showing all places in an application where data elements are accessed and updated.

Examples of these tools include DCD III ($22,500) from Marble Computer, Inc. in Martinsburg, W. Va., and PM/SS ($75,000 to $150,000) from Adpac Corp.

Archaeology adventures

One of the most frustrating experiences for any maintainer is when source code doesn't match the program under analysis. Even worse is trying to understand an ancient program in which the source code is *completely* lost.

Unfortunately, there's not a lot of automated help for this problem. When mismatches are involved, the best bet is to recompile the production version of the program and compare object modules.

When source code is lost, the only recourse is to try to manually reconstruct the program. Some help can come from a disassembler tool — if anyone on the staff can read assembler code.

A few tools, such as XA Systems' React, will help bring the assembly code into skeletal Cobol, but they require substantial manual effort. Some consulting companies employ proprietary tools to help with this task.

The long-term goal is to prevent these problems by using version-control standards, procedures and tools. Source library tools, such as Panvalet ($22,500) from Pansophic Systems, Inc. in Lisle, Ill., and CA-Librarian ($18,000 to $105,000) from Computer Associates International, Inc. in Garden City, N.Y., store program source code, provide the capability to store multiple versions and offer access-control features.

For more comprehensive configuration control, a tool such as CCC from Softool Corp. in Goleta, Calif., may be the answer. This tool can store any machine-readable data and link data into multiple system configurations.

Previous versions of a program or an entire system can be retrieved.

Shops with purchased application packages often face the dilemma of how to install a new version of the package without losing customized changes. The Version Merger tool from Princeton Softech, Inc. provides assistance for impact analysis, consolidation and reconciliation of different versions of application programs.

Most IS executives know how much of their budget goes to maintenance, but they also face a business decision: Should they keep hiring people to run after lizards and wrestle alligators, or should they invest in some lizard-herding and alligator-prevention tools? The decision isn't easy, but if the right decision is made, it will pay dividends many times over. ●

Don't even say the word "maintenance" at Boston Edison. At the Massachusetts-based utility, it's called "operational support," according to John Dubiel, manager of planning and technology.

"We're not trying to hide something," Dubiel says. "We're just trying to get across what our application programmers do, which is supporting applications that are in production."

The biggest obstacles Boston Edison maintainers face are old, unstructured applications. What's worse, most of the old code for back-office applications is written in assembler or fourth-generation languages, which makes tool selection difficult.

"We've been trying to rewrite those applications since the early '80s using some analyzing tools, but there aren't many of them," Dubiel says. So far, this has inhibited him from getting into re-engineering, although he's looking into conversion services.

Dubiel does use Viasoft, Inc.'s Via/Smarttest, a testing tool that allows him to see the program as it executes, and Legent Corp.'s Endevor, a source-code manager that keeps track of multiple versions of an application.

As for the future, Dubiel says his staff is in the requirements-gathering stage of incorporating computer-aided software engineering tools into the maintenance methodology. "We're looking at the implementation to begin this year, but it will probably take four to five years to complete," he says. "It's a long process."

SUSAN NYKAMP

Keeping the stress in check

There's an irony to reactive maintenance. As routine as it is, it's also extremely stressful, what with systems failures requiring immediate corrective action — often late at night — and bugs in system output, usually pointed out by unhappy users.

Some relief is available in today's crop of testers and debuggers, however. Old-timers probably remember the early days of IBM's OS operating system when core dumps were the only debugging aid. Today, even the most basic debugger provides a smart core dump.

For example, Abend-Aid from Compuware Corp. in Farmington Hills, Mich., prints an English language explanation of abnormal terminations. Although it doesn't fix the problem, it makes it easier to find the cause.

It's even easier to find bugs when you can watch them in action. Some debuggers let the programmer watch the source code as it executes at a user-controlled speed.

Examples of these tools include Xpediter from Compuware, Via/Smarttest from Phoenix-based Viasoft, Inc. and Intertest from Fort Lee, N.J.-based On-Line Software International, Inc.

These debuggers may not be able to point out bugs that are very complex, but they at least give the maintainer a scientific approach to finding the root of a difficult problem. Maintainers can make hypotheses about the nature of the problem, modify data values if necessary and then verify or refute each hypothesis.

Regression lurks

Once a change is made to a system, it needs to be tested. A particularly important testing technique is regression testing, which detects unexpected changes in the behavior of a system that result from another change to that system.

On-line systems can be regression-tested with mainframe tools such as On-Line Software's Verify. On personal computers, capture/replay tools capture keystrokes and system responses during a test session, play the keystrokes back for subsequent tests and compare the system responses on playback with responses from the original session.

PC-based capture/replay tools include Capbak from Software Research, Inc. in San Francisco and CA-Traps from Computer Associates International, Inc. in Garden City, N.Y.

One problem with capture/replay tools is that they flag all changes, both expected and unexpected. More sophisticated systems, such as DCATS from Systems Design & Development Corp. in Boulder, Colo., allow testers to develop test scripts that specify both the input message and the expected response.

Regression testing for batch systems often involves parallel testing, which runs the same data through the production and test versions of the batch programs and compares the resultant output files and databases.

File comparators, such as Comparex from Sterling Software, Inc. in Rancho Cordova, Calif., are commonly used to perform these comparisons. ●

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Trax Softworks, Inc.

Source code analyzers[1]

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	MEMORY REQUIRED (BYTES)	LANGUAGES ANALYZED	ANALYSIS FUNCTIONS PERFORMED	METHODS FOR FLAGGING POTENTIAL PROBLEMS	TYPES OF REPORTS PRODUCED	MEASURES CODE COMPLEXITY	USER INTERFACE SUPPORTED	PRICE	MAINTENANCE FEE[2]
[illegible]	Code Check	IBM PCs and compatibles, [illegible], Apple Macintosh, DEC VAX	DOS, Macintosh OS, OS/2, Unix	[illegible]	C, C++	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems	[illegible]	Graphs, text, histograms	Yes	Command line, Windows, Presentation Manager	[illegible]	None
Aldon Computer Group, Inc. (415) 839-3535 (800) 825-5858	Aldon/Analyzer	Any IBM or compatible mainframe running MVS, AS/400, System/38	MVS, CPF, OS/400	An additional 15% beyond that required by program being analyzed	Cobol, RPG-III	Identifies untested code	Asterisks identify untested code on source list	Source list with execution statistics	No	Command line	$3,000 - $4,500	$540 - $675
[illegible]	[illegible]	[illegible]	MVS, VSE	[illegible]	Cobol	[illegible]	[illegible]	[illegible]	Yes	ISPF, ROSCOE, TSO	[illegible]	[illegible]
Computer Associates International, Inc. (516) 227-3300	CA-Optimizer	IBM mainframes running MVS, VSE, VM	MVS, VSE, VM	NP	Cobol	Flags potential problems	Annotated source list	Performs range analysis reports	No	None; runs in batch mode	$15,000 - $84,000	15%
Computer Data Systems, Inc. [illegible]	[illegible]	IBM mainframes and compatibles	DOS/VSE, MVS, VM	1M	Cobol, CICS, [illegible]	Documents data and control flow, diagrams code, flags potential problems, [illegible]	[illegible]	[illegible]	Yes	ISPF, JCL, TSO	[illegible]	18%
Compuware Corp. (313) 737-7300 (800) 521-9353	Navigator, Navigator/PM	IBM System/370, ESA/370 for Navigator; IBM PCs and compatibles for Navigator/PM	MVS/ESA, MVS/SP, MVS/XA, OS/2	1M for Navigator/PM	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems	Marks source statements	Code structure, path, data graphs, I/O charts, control flow graphs, data and paragraph cross reference	Yes	ISPF for Navigator; Presentation Manager for Navigator/PM	$20,000 - $45,000	15%, first year free
Digital Equipment Corp. [illegible]	VAX LSE/SCA	DEC VAX, Microvax, Vaxstation	VAX/VMS	[illegible]	Ada, Basic, Bliss-32, C, Cobol, Fortran, Pascal	[illegible]	[illegible]	[illegible]	No	[illegible]	[illegible]	[illegible]
Dynamics Research Corp. (508) 475-9090 (800) 522-7321	Adamat/D	DEC VAX, Rational, any Intel 80386-based PC running SCO Unix	VMS, Delta, SCO Unix	NP	Ada	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Summarized data reports, error flags inserted in code as comment lines	Standards adherence, nonadherence reports	Yes	Command line	$5,000 - $25,000	15%
Eden Systems Corp. [illegible]	Q/Auditor Cobol, Q/Auditor PL/I	IBM 3080, 3090 series, PCs and compatibles; Tandem machines on Cobol version	DOS 2.1 and higher, MVS, OS/2 1.2 and higher; Guardian on Cobol version	640K	Cobol or PL/I	Checks for ANSI or company standard conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Graphics report, program listing with diagnostic messages, summary with line number references	Audit, diagnostic listing and summary, delta report showing changes between program versions	Yes	ISPF on MVS, menus on PCs	[illegible] for PC version, [illegible] for Tandem version, [illegible] for MVS version	10%, first year free
Hypersoft Corp. (617) 864-8860 (800) 468-8860	Application Browser	DEC VAX, IBM PCs and compatibles	DOS, VAX/VMS	640K on PC, 500 pages on VAX	Cobol	Diagrams code, flags potential problems	Graphics and text reports; isolates modules for further study	Problem reports, call, perform and GOTO charts	No	Command line, proprietary windowing system	$3,000 - $40,200	1% per month for VAX, 1.25% per month for PC
[illegible]	[illegible]	IBM PCs and compatibles	DOS, OS/2	640K	C	Provides source code reports	NA	Variable and function frequency, call trees	No	Command line	[illegible]	[illegible]
Language Technology, Inc. (508) 741-1507 (800) 732-6337	Inspector	IBM 3080, 3090, 4300 series	MVS/ESA, MVS/SP, MVS/XA, VM	118+ tracks disk space	Cobol, CICS	Checks for ANSI conformity, flags potential problems, graphs portfolio quality, measures complexity	Summary tables	Quality graphs, histograms, summary tables	Yes	ISPF	$18,000 - $27,000	15%
	Pinpoint	See above	See above	91 + tracks disk space	Cobol, CICS	Checks for ANSI conformity, diagrams code, flags potential problems, provides control flow analysis	Cross reference tables, in-stream program comments, warning messages on control flow chart	Annotated lists, metrics report, cross reference and control flow charts	Yes	ISPF	See above	15%
M. D. Friedman & Associates, Inc. (314) 644-1379	MDF Cobol Standards Analyzer	IBM PCs and compatibles	DOS 3.1 and higher	640K	Cobol	Analyzes data use, placement of comments and program structure, checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems	Code lists with marks, error messages	Data element use, unused data summary, standards violations, used and unused verbs summary	No	Menus	[illegible]	20%
McCabe & Associates, Inc. (301) 596-3080 (800) 638-6316	Analysis Complexity Tool with Battlemap	Sun, HP/Apollo, DEC, NCR, IBM PCs and compatibles	Domain, HP-UX, Sun OS, Ultrix, VMS, DOS	4M	Bliss, CMS2	Provides test paths, conditions, graphs	Graphics of code quality, lists of code paths requiring testing	Structure charts, testing information, module flow graphs	Yes	Command line, menu-based	$6,500	15%
Procase Corp. (408) 727-0714	Smartcheck/Smartview	Sun-3, Sun-4, Decstation, IBM RS/6000, Mips R2000, R3000	AIX, RISC OS, Sun OS, Ultrix	16M	C	Checks multiple defects and ANSI conformity, detects inconsistencies for programmer-defined variables, diagrams code, filters based on identifier type and use, flags potential problems, [illegible]	Marks and provides navigation to problems	Call graphs, filtered text views	No	X Window	[illegible]	10% - 15%
Quantasm Corp. (408) 244-6826 (800) 765-8086	ASM Flow Professional	IBM PCs and compatibles	DOS	256K	Assembler	Diagrams code, flags potential problems	Marked in flow charts	Flow charts, tree diagrams, register analysis, cross references, timing information, stack usage	No	Command line, menus	$200	None
[illegible]	PC-Metric, UX-Metric, VX-Metric	IBM PCs and compatibles, DEC VAX, Sun Sparcstations and 3 series	DOS, Unix, VMS	None	Ada, assembler, C, C++, Cobol, Fortran, Modula-2, Pascal, Quick Basic	Evaluates maintainability, testability, flags potential problems	Exception report via text or graphics	Exceptions, procedure-by-procedure metrics, summaries, pie charts, histograms	Yes	Command line, menu-based	$199 for PC-Metric, [illegible] for UX-Metric, [illegible] for VX-Metric	None
Software Quality Tools Corp. (508) 366-5045	Software Quality Management System	Sun Sparcstation and compatibles	Sun OS 4.1	4M	Ada, assembler, C, C++, Cobol, Fortran, Lisp, Pascal, PL/I, VHDL	Diagrams code, flags potential problems, monitors actual and predicted failure rates and code volatility	Predictive modeling, identifies problem modules and time of next expected failure	Text, graphs of cost and time-dependent data	Yes	X Window	$15,000 - $55,000 for stand-alone version; $25,000 - $85,000 for network version	$225 - $1,275 per month
[illegible]	Analyzer	IBM 3080, 3090 series	MVS	1M	Cobol, CICS	Flags potential problems	[illegible]	[illegible]	No	Command line	[illegible]	[illegible]
	[illegible]	IBM 3080, 3090 series	MVS	[illegible]	Cobol	[illegible]	[illegible]	[illegible]	No	Command line	[illegible]	[illegible]

[1]Code analyzers (as defined by CASE Associates in Oregon City, Ore.) evaluate source code for conformance with accepted programming practices and identification of "dead code" or logic flaws and measure program characteristics that make them difficult to maintain, i.e. logic nesting, program size, number of verbs and I/O characteristics. Products listed are stand-alone code analysis tools. Maintenance tools that incorporate code analysis functionality with other capabilities are not included.
[2]Maintenance fees are per year, unless otherwise noted.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE REQUIRED	OPERATING SYSTEMS SUPPORTED	MEMORY REQUIRED (BYTES)	LANGUAGES ANALYZED	ANALYSIS FUNCTIONS PERFORMED	METHODS FOR FLAGGING POTENTIAL PROBLEMS	TYPES OF REPORTS PRODUCED	MEASURES CODE COMPLEXITY	USER INTERFACE SUPPORTED	PRICE	MAINTENANCE FEE[1]
[illegible]	4C Classic, 4C Brief	IBM PCs and compatibles	DOS, OS/2	384K	C, Pascal, Modula, Modula-2	Finds functions, data-type definitions, variables defined, structures, rationalizes data names	NA	None; produces operate on-line	No	Pull-down menus	$119	None
V-Communications, Inc. (408) 296-4224 (800) 848-8366	ACM Checker	IBM PCs and compatibles	DOS	384K	Assembler	Detects inconsistencies for programmer-defined variables, flags potential problems	Identifies file name and line number	Lists of code problems	No	Batch file, command line	$180	None
[illegible]	Logiscope	[illegible], Sun, DEC VAX, IBM	AIX, Domain, HP-UX, Sun OS, Ultrix, VMS	4M for workstation version	Ada, assembler, Ada, C, Cobol, Fortran, Pascal, PL/M, PL/I	Analyzes complexity, diagrams code, flags potential problems, performs regression and test coverage analysis	Detects complex modules and testing weaknesses, variables and variables code	Control graphs, call graphs, Kiviat diagrams	Yes	Dataviews, Softbench, Emacs, X Window	$10,000	15%
Viasoft, Inc. (602) 952-0050 (800) 225-0083 in the U.S. (800) 343-1578 in Canada	Via/Insight	IBM mainframes and compatibles	MVS/ESA, MVS/SP, MVS/XA	2M	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, flags potential problems, rationalizes data names	On-line interface	Any programmer-defined view using ISPF	No	ISPF	$30,000 - $70,000	15%
	Via/Smart-doc	See above	See above	2M	Cobol	Checks for ANSI conformity, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems, rationalizes data names	Summary reports	Table of contents, master index, enhanced data cross reference, advanced source listing, structure chart, software metrics report	Yes	ISPF, ROSCOE, WYLBUE	$17,000 - $40,000	15%
XA Systems Corp. (408) 296-3000 (800) 344-0050	Pathwy	IBM System/370, System/390, PCs and compatibles	MVS/ESA, MVS/SP, MVS/XA, DOS	2M for DOS, 4M for MVS	Cobol	Checks for ANSI conformity, cross-reference logic, detects inconsistencies for programmer-defined variables, diagrams code, flags potential problems, reports on complexity and architecture modules	Counts and identifies problems by category in end list, indicates location	Management and organization level reports, source analysis, logic and quality assurance diagrams and lists	Yes	ISPF, Micro-focus runtime interface	$50,000 - $66,000 for MVS version; $1,500 - $3,000 for PC version	15%

The CASE for maintenance relief

BY GEOFFREY BARNES AND BILL DECHERD

CASE isn't just for development anymore — or so users are hoping. Computer-aided software engineering (CASE) may be best known for its promise to revamp and speed up the development process, but many observers also view it as an ideal maintenance environment.

Application development in CASE, also called forward engineering, starts with a business model, is followed by logical and physical design and ends with code generation. This process promises high-quality applications that require less maintenance and are undamaged by changes made to them.

The problem, however, is that information systems groups can't simply dump their existing applications and use CASE to write new ones. Embedded in those programs are long-established business rules that may exist nowhere else.

The crucial links between existing applications and a CASE environment lie in re-engineering and, more specifically, reverse engineering.

Reverse engineering inverts the forward engineering process, using existing code to produce a physical design from which a logical design is derived. A business model is built from the logical design.

Re-engineering can refer to a range of tasks and tools. In terms of CASE, it encompasses reverse engineering and forward engineering as a complete cycle.

A growing number of tools support reverse engineering. However, most of these handle only the data side of the job. ADW from Knowledgeware, Inc. in Atlanta and Data Analyst from Bachman Information Systems, Inc. in Burlington, Mass., support data reverse engineering.

The personal computer-based Bachman tool goes as far as to derive entity-relationship diagrams from Cobol and PL/1 data definitions.

Reverse engineering the process side is much more difficult than reverse engineering the data, and automated support is correspondingly lean. Vendors are, however, progressing in that direction. Some examples include the following:

- Design Recovery from Index Technology Corp. in Cambridge, Mass. This $9,800 tool, which ties into the firm's Excelerator line of CASE development tools, can populate an Excelerator repository with program structure charts derived from Cobol code.
- Source/RE from Transform Logic Corp. This $3,800 tool produces structure charts and logic flow diagrams and performs complexity analysis.
- The Intercase tool from Interport Software Corp. in Fairfax, Va. Intercase provides a platform for application analysis and can migrate structure charts into Knowledgeware's Information Engineering Workbench.
- Renaissance from Viasoft, Inc. This tool traces data and logic flow to isolate portions of code.

Source: CAP Gemini America

Because reverse engineering is still a formative concept, prospective buyers should carefully examine tools that bear such a label. Some tools have little, if any, link to CASE tools. ●

[redacted]

To Denny Zweifel, the job of keeping a low-maintenance backlog starts with development. "It really depends on well-organized, well-thought-out, structured code," says Zweifel, who is division manager of analysis and programming at Deere & Co. in Moline, Ill.

That way, maintainers could spend less time fixing bugs and more time adding functional improvements for users. "Maintenance should be viewed as improvements to existing systems," he says.

There are plenty of bugs in the real world, however. The tools Zweifel uses on an everyday basis include Compuware Corp.'s Xpediter and XA Systems Corp.'s Xpert.

For cross-referencing, Zweifel uses Computer Data Systems, Inc.'s Scan/Cobol and Marble Computer, Inc.'s DCD III.

Deere already uses various CASE tools for development tasks. In terms of re-engineering, the company is pursuing various approaches and is evaluating several tools in that area.

However, "the controlling factor is not some maintenance tool," according to Zweifel. "It's how well you write the code in the first place."

SUSAN NYKAMP

Providers at your service

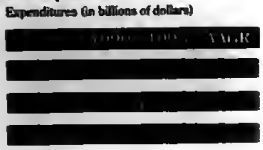
The following companies provide re-engineering services such as reverse engineering and restructuring applications, code reuse, transporting systems to new platforms and re-engineering for CASE (see chart):

- **Ernst & Young Redevelopment Engineering Services.** *Contact: Al Hershey (313) 971-1907*
- **Deloitte & Touche information technology consulting services practice.** *Contact: Thaine Lyman (312) 946-3032*
- **KPMG Peat Marwick.** *Contact: Kenneth Coppins (312) 444-1177*
- **Andersen Consulting.** *Contact: local Andersen office*
- **CAP Gemini National Re-engineering Practice.** *Contact: Tim Klimuc (212)-944-6464*
- **Coopers & Lybrand [Software Engineering Center of Excellence].** *Contact: Rich Harman (215) 963-8511*
- **Price Waterhouse RE/Center.** *Contact: Steve Errico (213) 396-3844*
- **Computer Task Group.** *Contact: Paul Fjelsted (919) 850-9861*
- **Bell Atlantic Systems Integration.** *Contact: Paul Sikora (703) 516-2911.*

Re-engineering forecast

According to IS executives at 13,000 large organizations, more funds will be allocated to re-engineering services than to products

Expenditures (in billions of dollars)



[1] Projected
[2] Average aggregate growth rate
[3] Includes back-end CASE tools

Source: G2 Research CW Chart: Tom Monahan

Estimating maintenance costs

BY JUDITH S. DEBRANDT

You can count on two things from software maintenance: It will always be necessary, and it will always cost money.

Many companies are attempting to diminish these costs through re-engineering and computer-aided software engineering (CASE), but of more immediate concern is identifying and managing those maintenance costs that will not go away. Cost-estimating tools can lend a hand.

These tools are usually modules within sophisticated modeling software packages that address many phases of system development, not just maintenance.

Maintainers can input a variety of factors, including the development schedule, labor and tasks required to develop the application (including cost and hours), the risk involved and, more recently, function points, which measure a number of elements intrinsic to an application.

The cost-estimating tool can then build the project budget, provide staffing profiles, consolidate projects into a single portfolio for comparison purposes and isolate the cost for a particular phase such as maintenance.

Available tools vary widely in their functionality, ranging in price from $500 to more than $20,000. Some predict future patterns using historical data derived from actual projects. Others use mathematical theory with complex formulas that let maintainers tailor the estimate to reflect factors such as the use of "modern" development practices or the staff's skill level.

Well-established tools include Computer Associates International, Inc.'s CA-Estimacs and CA-Planmacs and Quantitative Software Management's Slim-Control.

CA's products take an historical approach based on more than 13,000 projects. They are derived from initial work performed by Howard Rubin. Personal computer-based, they sell for more than $20,000.

PC-based Slim-Control uses Larry Putnam's mathematical theory and recently added function point analysis.

Another function point-based tool is from Software Productivity Research, Inc. SPQR/20 Estimator is PC-based, costs about $5,000 and offers risk analysis features as well as cost projections that can be translated into foreign currency.

Other estimating tools are closely tied to methodologies and CASE. Andersen Consulting offers its PC-based Method 1, which provides cost estimates for all phases of the development life cycle. The $50,000 product is closely aligned with Andersen's Foundation methodology.

AGS Management Systems, Inc. has incorporated its estimating tools into First CASE, available in PC and mainframe versions and priced between $2,500 and $49,000. First CASE uses sensitivity analysis to provide minimum and maximum cost ranges for each phase.

Other vendors offer tools built around mathematical models. Market Engineering Corp.'s CB Cocomo, available on the Apple Computer, Inc. Macintosh, extracts Cocomo criteria into a spreadsheet (see story this page). It uses Monte Carlo simulation to determine the probability of the estimate and requires a companion product, Crystal Ball, to establish high and low ranges.

Softstar International, Inc.'s Costar, also based on Cocomo, runs on PC and Digital Equipment Corp. VAX platforms and costs between $800 and $1,500. It provides estimates for eight different maintenance activities.

Two new products are Gecomo Plus from GEC-Marconi Software Systems and Software Quality Tools Corp.'s Software Quality Management System (SQMS).

Gecomo Plus, which comes in workstation and mainframe versions priced from $4,000 to $12,500, uses both Cocomo and the new Ada model for Cocomo. It allows for separate input for the maintenance phase and has both graphical user interface and X Window System features.

SQMS, not yet released, will be available on Unix and MS-DOS platforms. It will be fed by the number and frequency of changes to the source code during development and will link the stability of the initial code to the expected number of maintenance actions. ●

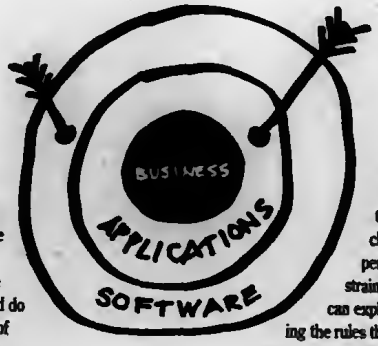
Cost-estimating theories

- Barry Boehm's Cocomo, which stands for Constructive Cost Model, is a mathematical model that can be refined with certain preset factors that alter the model.
- Larry Putnam's Software Life Cycle Management, or Slim, is another mathematical model that uses both productivity and manpower indexes.
- Howard Rubin uses mathematical formulas but factors in business practices unique to the company and independent of the model.
- Capers Jones similarly uses function points to look beneath costs at underlying quality and productivity issues.

JUDITH S. DEBRANDT

DeBrandt is program manager of the Software and Information Management Service at Information Strategies Group, Inc. in Vienna, Va.

As long as the aim of CASE vendors is better software, they'll be off-target.



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BUYERS' SCORECARD

Realia nets top ratings with fast approach

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Realia Corp.'s Realia-Cobol offers a fast, simple solution to the critical task of compiling and debugging large system applications, and its users like it that way.

Realia achieved the highest overall rating, with top scores in nine out of 15 criteria in *Computerworld*'s Buyers' Scorecard on personal computer-based Cobol compilers.

Despite having the smallest market share of the three products surveyed, Realia outscored both Microfocus, Inc.'s Microfocus-Cobol and Liant Corp.'s RM-Cobol by five points.

Each user group evaluated only its own product. A rating of 1 signified poor, and 10 was very good. Total scores were based on the average ratings of each group multiplied by the average importance ratings set by all users surveyed (see methodology next page).

PC compilers provide alternatives to mainframe-based compilers and thus offer more efficient, less expensive ways to maintain and develop large applications.

Realia and Microfocus aim their products primarily at emulating the IBM and compatible mainframe environment, while RM-Cobol is a multiplatform compiler that supports non-IBM mainframe and Unix applications.

Technical support, programmer productivity and debugging were the three top concerns of the users surveyed. (Each category achieved an 8.6 or higher importance rating.) Realia scored 8.4 in technical support, well ahead of the other products, and achieved the highest rating for providing a productivity increase, although Microfocus trailed by only a hair.

Microfocus users rated it highest for its debugging features, giving it a 9.3 — the highest rating for any product on any measure. (Second honors for highs in a single category went to Realia, which was given a 9.1 by its users for compilation speed.)

Other Microfocus strengths, according to the survey, include compiling mainframe-compatible applications — the key feature many users look for in PC compilers — and supporting computer-aided software engineering (CASE) tools.

Overall, however, the users rated basics such as technical support, code production, service, speed and ease of use as more important. Microfocus, which takes a more complex, full-featured workbench approach to its tool set, did not fare as well on the basics, coming in last place by a significant stretch in producing code and ease of use.

Portability turned out to be RM-Cobol's major strength. The product, which has had a long history, including ownership by a variety of vendors, scored top ratings in running on a local-area network, efficient memory use and compiling applications for a variety of platforms. In addition, it has developed a significant and loyal customer base, despite its many moves.

While its users applauded the open systems approach of RM-Cobol, multiple platform capability came in second-to-last overall in terms of user-assigned importance. RM-Cobol scored last in key areas such as debugging and speed as well as in the ability to increase programmer productivity.

RM-Cobol users would like it to offer better debugging and screen handling. Likewise, Realia users say they want to see CASE support and improved mainframe compatibility. Microfocus users say they want a graphical user interface and better memory handling.

Users' ratings of their overall satisfaction with the products also placed Realia at the top of the list. Realia users rated it 9 in overall satisfaction on a 1-to-10 scale where 10 is best. Microfocus and RM-Cobol users each assigned their products an 8 out of 10. •

COMPUTERWORLD BUYERS' SCORECARD

PC-Based Cobol Compilers

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Microfocus: 40; RM-Cobol: 35; Realia: 35

Product	Highest ratings	Lowest ratings
Realia's Realia-Cobol SCORE 65	Speed Ease of installation Producing code that does not require additional work	Support of CASE Compiling applications for different platforms Training required to use product
Microfocus' Microfocus-Cobol SCORE 61	Effectiveness of debugging features Compiling mainframe-compatible applications Ability to increase programmer productivity	Efficient use of memory Training required to use product Ease of installation
Liant's RM-Cobol SCORE 60	Compiling applications for different platforms Ability to run within a local-area network Producing code that does not require additional work	Product's support of CASE Training required to use product Ability to increase programmer productivity

KEY RATINGS

Realia achieved the highest ratings in five of the six areas that users said were most important to them, including speed and clean code production. The single highest rating for any category was given to Microfocus for effective debugging features

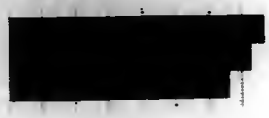
User importance rating:

8.7 Quality of technical support

8.6 Ability to increase programmer productivity

8.6 Effectiveness of debugging features

8.5 Producing code that does not require additional work



8.5 Responsiveness of vendor service

8.4 Speed

A CLOSER LOOK

Microfocus users rated their product tops in compiling mainframe-compatible applications and support of CASE. RM-Cobol users gave their product the highest ratings for its ability to run within a LAN, efficient use of memory and compiling applications for different platforms

User importance rating:

8.1 Overall ease of use

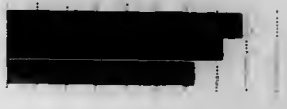
8.0 Compiling mainframe-compatible applications

8.0 Cost vs. benefits provided by product

7.5 Ability to run within a local-area network

7.5 Efficient use of memory

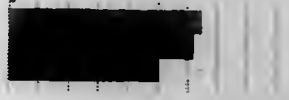
7.4 Ease of installation



7.4 Training required to use product

6.8 Compiling applications for different platforms

6.5 Product's support of CASE



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers)

Likes
Mainframe compatibility
Speed
Debugger

Dislikes
Slow to upgrade
Debugger
Documentation

Likes
Debugger
Flexibility
Well-integrated

Dislikes
Memory requirements
Long learning curve
Documentation

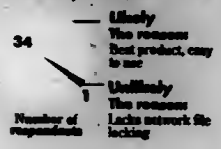
Likes
Portability
Easy to use
Reliable

Dislikes
Needs better debugger
Error messaging
Manual

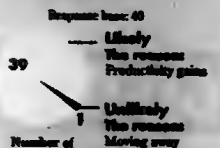
Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Reasons based on most frequently stated responses)

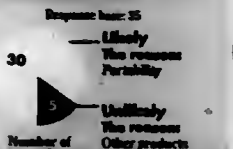
Response base: 35



Response base: 40



Response base: 35



Wish List

What features or functions would you like to see added?
(Answers are based on the most frequently stated responses)

- Computer-aided software engineering integration
- DB2 support
- Better mainframe compatibility

- Windows support
- Better memory handling
- Simplify

- Improve debugging
- Better screen handling
- Color in Unix modes

Vital statistics

Total number of respondents: 110

With which personal computer and operating system do you use this product?

80386/DOS	65
80286/DOS	21
80486/DOS & Unix	14
Workstation/Unix	10

On which platform do most of the compiled applications run?

Mainframe	53
Personal computer	46
Workstation	7
Minicomputer	4

How long have you been using this product?

0-1 year	32
2-3 years	38
4-5 years	18
More than 5 years	22

METHODOLOGY

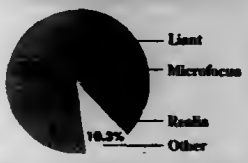
To qualify for *Computerworld*'s Buyers' Scorecard on personal computer-based Cobol compilers, a product had to be one of the top three PC-based compilers in terms of market share and installed base.

The response base was as follows: Microfocus, Inc.'s Microfocus-Cobol — 46; Liant Corp.'s RM-Cobol — 35; Realia Corp.'s Realia-Cobol — 35.

The survey was conducted by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Random lists of users were surveyed. The lists were obtained from objective nonvendor sources and from vendors.

Market Share

Based on number of units shipped



Source: International Data Corp.

The total weighted scores were computed by multiplying the mean scores users assigned to all criteria by the mean scores each user group gave its own products. Ratings are presented in order of importance to all users based on these mean importance ratings.

For example, Realia's 8.4 rating for quality of technical support was multiplied by the importance rating of 8.7 for a total of 73. This figure was added to the other Realia ratings multiplied by their importance factors. The sum was then divided by the total number of categories — 15 — to determine Realia's total score of 65.

The categories were developed in consultation with consultants familiar with the products. The importance of each criterion was assigned based on user ratings on a 1-to-10 scale, with 10 being most important.

ACKNOWLEDGMENTS

Computerworld acknowledges the assistance provided by the following individuals and companies: Installed Technology International; Ed Acly, Technology Investment Strategies Corp.; Judith Dulbrandt, Information Strategies Group, Inc.; and J. Chris Miller, J. Chris Miller and Associates.

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Tom Harper, BMC corporate architect, covers the *"Past, Present and Future of Data Stream Optimization"*

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Look who's in the IS business

User companies are turning their in-house software and services expertise into commercial market offerings

BY BARBARA FRANCETT

Your company's business is light-years from the computer industry, but your information systems group has a dynamite system or service. Lately, your customers and vendors have been prodding you to offer it commercially. Do you take the plunge?

Most IS chiefs who've been there say they believe you can achieve prestige, new markets and revenue sources for your company by entering the business of IS. But the move requires important decisions about what to sell, how to organize, who to staff and where the money goes.

There are no simple answers here: What's wrong for one organization is right for another.

A common mistake is assuming "business is business," says Scott Shultz, general manager at Du Pont Information Engineering Associates (IEA) in Wilmington, Del.

IEA developed the Rapid Interactive Production Prototyping methodology for building software in Digital Equipment Corp. environments, an offering it has sold to external clients since Dec. 31, 1990.

"It takes a different skill set" to be a software or services company rather than, say, a manufacturing company, Shultz says.

The University of Southern California at Los Angeles (USC) found that out when it decided to sell the Total Online Application Development System (memorably dubbed TOADS), its fourth-generation language applications generator running on Prime Computer, Inc. machines.

"We had no intention of marketing" the system until Prime urged us to do so, says Dianne Bozler, director of USC Software Systems, formed in 1988 as an offshoot of USC's administrative computing group. Bozler and her group found themselves putting together price lists, user documentation, training and support for software previously provided free only to the school.

Consultants and IS chiefs strongly recommend that firms go into the software or services business with their eyes open. "You need to know who the competitors are and how they price their products, as well as what unique features differentiate your product," says Norton Kubilus, vice president of management services at Optimal Solutions, Inc., a consultancy in Hoboken, N.J.

"You can lose a bundle in supporting something that should never have gone to market," he adds.

William Harris, chairman at Behnke Harris & Associates, Inc., a New York management and information technology consultancy, adds customer service, maintenance, new releases and liability to the list of responsibilities.

Haves and have-nots

Companies that have made such a move advise the use of evaluation studies (see story page 76) and consultants to fill the gap between what a company has — the software or service — and what it doesn't have — commercial market expertise.

San Francisco-based Bechtel Group, for its part, launched an 18-month evaluation study to analyze whether it should move into the commercial realm. The impetus came from "clients, who often requested that the software tools developed for their [engineering] projects be left behind," explains John Lucas, president of Bechtel Software, Inc. in Acton, Mass., a wholly owned subsidiary of Bechtel Group.

Lucas, who was running another software firm at the time, participated as a consultant in the study. "The study showed this was a logical extension for Bechtel. It also recommended that we run it as a legitimate commercial software business," he says.

The company was incorporated in 1987, with Lucas as its first employee.

Bechtel Software consists of three divisions: project management and computer-aided engineering (CAE) software, engineering systems and AI Institute, which offers expert systems consulting services.

Michael Elkan

The company employs no developers, acquiring its wares from other Bechtel groups and paying them for their services by contributing to a pool of development funds. The company also markets products from

Continued on page 75

Francett is a free-lance writer based in Bloomfield, N.J.

User companies with an IS twist

Company	Product/Service	Formed	Biggest surprise	Hardest task	Recommend?
USC Software Systems	TOADS 4GL application generator; financial and administrative systems	1988	The nuances of salesmanship	Learning to withstand rejection by potential customers	Yes, if you have a good product and good support
Bechtel Software	Computer-aided engineering and AI software; consulting	1987	None	Gaining the respect of Bechtel's other lines of business	Yes
Agway Data Systems	Computer and network outsourcing services; disaster recovery services; communications consulting	1987	The level of customer satisfaction	Acquiring marketing, advertising and on-site selling skills	Yes, if services have good internal reputation, you maintain business focus and you have top-down mandate

CW Chart: Marie Haines

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Continued from page 73

third parties, such as database vendor Oracle Systems Corp.

Support services augment the software and consulting businesses. Maintenance services are charged on an annual basis as a percentage of the software fee. Training and consulting fees are based on the product and the customer's needs.

Five years ago, Agway, Inc., a farmers' cooperative made up of eight different businesses in eight different industries, hired The Diebold Group, a New York-based consultancy, to study if and how Agway should approach the commercial marketplace.

IEA's Shultz: *Businesses differ*

"The study came back favorable and with a proposed business plan," says Dennis LaHood, president of Agway Data Systems (ADS), a wholly owned subsidiary of Agway created from the IS group.

ADS uses a chargeback system for internal users. Because internal users were thought of as customers, "that made the transition to handling external customers much less traumatic," LaHood says.

The company offers its external clients computing and networking outsourcing services, disaster recovery and communications consulting — but no software.

"We made a conscious decision to be on the service side [externally]," LaHood says. "Many of the software products developed internally provide competitive advantage to our internal client base. It wouldn't be appropriate to market them," he adds.

ADS continues to provide all aspects of IS to its internal customers, including systems development, voice and data networking, PC and minicomputer support and all new technical research and applications.

Sharing the burden

Beyond revealing the viability of a commercial move, a consultant can also take on some of the hassles associated with selling externally.

For commercial companies that are spun off as separate units, such as Fields Software Group, a sister company of Mrs. Fields Cookies and maker of the IBM System/38-based Retail Operations Intelligence system, hiring their own sales and marketing groups makes business sense. In Fields Software's case, selling $1 cookies to individual consumers and selling million dollar software to supermarkets demand different tactics.

However, commercial ventures that are not separate entities will increasingly rely on partnerships to "handle the burden of marketing and supporting products" at a reasonable cost, says Scott McLarnon, a consultant at Decision Research Corp.

Spencer Gifts, Inc., for example, joined in a partnership with a consultant to externally market and sell its Spencer Integrated Retail Information System (SIRIS), a mainframe-based retail system with relational database capability.

Eugene Murtha, Spencer IS vice president, met William G. Buoni, president of W. G. Buoni & Associates Ltd., at a meeting of the National Retail Federation in New York. Buoni possessed not only database design expertise but also software selling experience — qualifications

Continued on page 76

Breaking off is hard to do

Lack of experience, internal pressure forced WIS to drop commercial software

One company that has found it tough selling software to outside clients is Weyerhaeuser Information Systems (WIS), the IS arm of $10 billion lumber giant Weyerhaeuser Co. in Seattle. WIS dropped its commercial software business in January, according to Susan Mersereau, vice president and general manager at WIS.

"Our primary focus is to get better at serving Weyerhaeuser Co. That was questionable in the software area," she says.

Lack of internal acceptance and inexperience in the commercial marketplace worked against the venture, Mersereau explains.

WIS was created as a profit center in 1985 as part of a companywide diversification effort. Its 400 IS professionals serve both internal and external clients.

WIS provides services to its internal customers in four areas: networks and telecommunications, mainframe computing and local-area networks, applications development and support and research and development.

Externally, WIS sold in-house-developed software — a manufacturing system, transportation software and a computer-aided design scanning system — as well as services such as systems integration, disaster recovery and radio communications.

Mersereau: *I'd do it again*

That dual role resulted in conflict. "Originally, our focus was to go into the external market to improve our internal capabilities," Mersereau says.

WIS aimed to sharpen its project management, pricing and delivery skills as well as internal mechanisms such as billing, legal policies and contracts.

"We also wanted to find out if we were being competitive internally with our offerings or if we should buy outside products and services," she says. "This gave us a benchmark."

Problems arose. "The internal businesses didn't accept the commercial venture. They shared the perception that the best employees were being assigned to outside projects," Mersereau says.

Moreover, even though Weyerhaeuser had done extensive planning and had brought in external consultants before forming WIS, those efforts didn't anticipate some of the harsher realities of the software business.

"We learned that success in the software business requires staying power — product changes and development — outside our traditional scope," Mersereau explains.

WIS discovered that it had entered too many markets with too many products at the same time and had also miscalculated how long it would take to build a client base.

"We provided product support and upgrades," Mersereau says, "but we were constantly competing with vendors, which we would only have been able to keep up with by porting our products to more platforms. This would have required additional capital."

As a result, some products made money and others didn't. Mersereau declined to comment on profits, but 1990 WIS revenue was $50 million — $10 million in software and the balance in services.

Although the software business did not work out, Mersereau says her feelings about going into the business of IS have not soured. In fact, she says, the commercial plunge has been unquestionably worthwhile. "I would do it again in a minute," she says. "The transfer of knowledge was invaluable. We learned that we had to look at an offering from the product/service mix and ask ourselves if it should be offered internally."

Some of the products, such as the manufacturing system, are still used internally. WIS has made subcontracting arrangements to support its former external software customers.

Because the software business has been discontinued, WIS has changed the way it charges its internal clients. WIS still operates as a profit center for the services it offers externally, but internally it has shifted to a cost recovery system, a form of chargeback, Mersereau says.

Mersereau also emphasizes the importance of an intense executive commitment to such a venture.

Although Mersereau says she feels WIS has always had management's support, in hindsight she adds that WIS' efforts would have benefitted from closer attention.

"The support and commitment of the management structure of the company needs to deal with why you're there and what you're doing," she says.

WIS still has its hands in external undertakings through its disaster recovery services and systems integration efforts.

It has long-term contracts with external clients in both areas and plans to continue offering those services. ●

BARBARA FRANCETT

User companies with an IS twist II

Company	Product/Service	Formed	Biggest surprise	Hardest task	Recommend?
FMC	Network outsourcing; computer time services; manufacturing application software (in development)	1988	Differences between dealing with internal and external clients	Learning to cope with those differences	Yes, if you have low internal unit cost and high service level
Du Pont Information Engineering Associates	Rapid Interactive Production Prototyping methodology	1988	Inexperience with services business	Working with both internal and external clients	Yes, but be aware of support requirements
Spencer Gifts	SIRIS retail system (available during 1991)	Not applicable	None	Staying focused on product development rather than being distracted by potential revenue	Yes
Fields Software Group	Retail Operations Intelligence store management system	1990	The difference between marketing cookies and marketing software	Learning software marketing	Yes, if the commercial venture is carefully planned
[illegible] Information Services	[illegible] CIO [illegible]	[illegible]	Lack of support from internal businesses	Coping with shortcomings in planning	Yes

CW Chart/Marie Haines

Continued from page 75

critical to Murtha and his product.

Their pact enables Spencer to enjoy the benefits of selling its systems commercially without the headache of making sales, Murtha explains.

The contract between the two firms includes revenue goals that must be met "within reasonable time limits," Murtha says. Revenue will be split between the Birdsboro, Pa.-based consulting company and Spencer, although neither will reveal details of the arrangement. Spencer also retains the right to market SIRIS.

Lucas *conducted study for Bechtel*

Phase 1 of the system will be ready for sale to retail chains, department stores and food stores in June.

However, all the consultant advice in the world can't guarantee success. At Weyerhaeuser Information Systems (WIS), the IS unit of lumber company Weyerhaeuser Co., extensive studies and consultations failed to predict the hidden problems the company eventually ran into selling software. Those problems forced WIS to stop its software operations in January (see story page 75).

Dallas-based FMC Corp., a financial services outfit, began its commercial IS foray in 1988, following the recommendations of consultants. It sells services such as computing time and network outsourcing. But customers haven't been pouring in.

"We've successfully brought in revenue for the company, but the volume has been about half of what we'd like," says Randall Gannaway, director of the corporate data center, a DB2 shop. "There's a lot of people kicking tires out there."

For companies that do decide to take the commercial plunge, however, finding the right organizational and IS structure to back up the product or service is imperative. Some, such as Fields Software, break away completely to become a separate company. Others, such as Spencer, don't change the organization at all but rather take on a partner. And in many cases, the new business becomes a company subsidiary, operating independently but belonging to the parent organization.

Which way to go depends on the parent company's business, focus and goals.

As Randy Fields, former IBM mainframe programmer and chairman of Fields Software, notes, cookies and software are two businesses with little in common. Beyond the fact that it was Mrs. Fields' IS staff that formed Fields Software, the two are separate entities today. The cookie company pays to use the store management system like any customer.

When the relationship between parent company and spin-off remains close and the organization follows suit, staff members often flow from one to the other.

For instance, about half of Bechtel Software's 65 employees are from other Bechtel Group areas. A benefit of this arrangement, Lucas says, is career flexibility that helps Bechtel retain IS employees.

At ADS, the salaries of the 150-plus ADS staff members are paid by Agway. Some employees are devoted to internal development tasks, while others are assigned to both external and internal tasks. Assignments change with the length and needs of those projects, LaHood says.

Where the money goes

While profits remain elusive for many of these privately held fledgling ventures — with the exception of Field Software, which will achieve "significant profitability" in its first year, according to Randy Fields — their rule of thumb is to invest in building the business, then plowing revenue back into product development.

Last year, for instance, Bechtel Software's revenue was $12 million, a "good percentage" of which is applied to software enhancements and technology development.

USC Software Group puts the revenue it earns into the university's general operating fund and writes it off against the cost of development, which is in the millions, Bozler says.

IEA's revenue is poured back into the budget of New Business Design & Development Group, a "greenhouse for nurturing new business concepts" at Du Pont, according to Shultz.

ADS pays a dividend back to Agway each year, with a portion of its revenue retained for growth and reinvestment.

Despite its overestimation of the market, FMC reaps revenue and benefits from its external business.

Gannaway explains: "We have reduced costs internally because any revenue and profits the data center earns from its external customers is worked back into its rate structure and lowers the cost of computing hours."

While the challenges are many and the risks high — "Failure is more common than success," Fields notes — all of these IS entrepreneurs say they'd do it again to open new lines of business for the parent company. In fact, they encourage others to join them. •

To do and not to do

DO know what you're getting yourself into — you'll need to acquire a whole new set of skills to successfully sell software or services commercially.

DO set realistic expectations.

DO plan ahead to make your in-house-developed product more applicable to other businesses.

DO hire someone with expertise in marketing to do a market analysis.

DO think about what to develop next, or in a few years you'll have exhausted your market.

DON'T get into a business that is far removed from your company's primary business.

DON'T be naive about what it takes to bring a product to market and support it.

DON'T become enraptured with the profit-making aspects of external business and lose sight of the primary objective: strategic advantage for your firm.

Evaluation study ingredients

An evaluation study consists of the following, according to John Lucas, president of Bechtel Software in Acton, Mass.:

- **Market analysis.** Find out how and with what product or service you can compete against established companies. Questions include: What is the right product or service to sell? What market should we target? Does our product or service add value to that market? How can we differentiate ourselves from established competitors? How does our product fit into the competitor mix?
- **Mission statement.** Spell out your strategy and objectives. Is your objective profits, value added for the parent firm or new markets? What's your strategy for getting to your goals?
- **Business plan.** Put together a plan that describes the organizational setup (Will we be a wholly owned subsidiary or a separate company?); staff needs and costs (Should we hire executive staff, IS staff and/or sales and marketing staff, use the parent company's staff or contract with a third party?); start-up and operational costs; expected return on investment; and value-added concerns (Are we going to buy products? Will we make pacts with third parties?).

Lucas warns companies contemplating a commercial run that people can often make or break the venture. For example, don't take a software engineer and put him on the executive staff unless he belongs there.

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BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.

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BIMTEXT — Word processing, document composition system. Creats formatted documents from free-form input. DOS and OS.

BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.

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BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.

BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.

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23. Dir./Mgr. Sys. Development, Sys. Architecture
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32. Programmers, Software Developers
80. Sys. Integrators/VARs/Consulting Mgt.
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85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supv. of Programming, Software Dev.
32. Programmers, Software Developers
80. Sys. Integrators/VARs/Consulting Mgt.
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13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
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80. Educator, Journalists, Librarians, Students
99. Others _____ (Please specify)

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NATIONAL
BRIEFS

Buddy system

▶ Small businesses got some big technology partners early this month when the **Business Information Center** opened in Seattle. A joint venture of the **U.S. Small Business Administration**, the **Service Corps of Retired Executives**, **Microsoft Corp.** and **IBM**, the center places a sophisticated reference library, an assortment of computer counseling stations and a panoply of sample business plans at the disposal of small business owners.

The winter of our content

▶ A 15% surge in semiconductor orders last month sent the **U.S. semiconductor industry**'s book-to-bill ratio winging from .96 in January to 1.09 in February — the biggest month-to-month increase since March 1983, according to the Semiconductor Industry Association. Nearly $1.3 billion worth of new orders, or bookings, poured into U.S.-based semiconductor companies last month, the association said. Actual shipments into the U.S. market, or billings, for the month came to $1.2 billion — a 9% gain over the $1.1 billion billed in January.

Joining public life

▶ Colorado Springs, Colo.-based semiconductor company **Simtek Corp.** early this month added to what some Wall Street analysts believe will be a bumper crop of 1991 initial public offerings by technology firms [CW, March 18]. Simtek went public on March 6 with 1.95 million shares of common stock priced at $6 per share and an identical number of redeemable warrants at 10 cents per warrant.

Fun and games

▶ Entertainment software player **Sierra On-Line** and educational and productivity software player **Broderbund Software, Inc.** are about to get their acts together. Sierra Chief Executive Officer Ken Williams will hold the same position at the consolidated firm, which will be created through a stock swap and will be headquartered in Oakhurst, Calif. Broderbund Chairman and CEO Doug Carlston will remain in charge of the new firm's Broderbund operations, which will continue to run out of its current headquarters in San Rafael, Calif.

Group tries taming 'electronic frontier'

BY JAMES DALY
CW STAFF

The ready accessibility of personal computers, telephones, modems and dial-up services has created a vast and, some say, legally ambiguous electronic landscape that is rapidly shaping up as the next proving ground for personal and legal freedoms.

Hackers, scholars and information police who will gather at the first annual Conference on Computers, Privacy and Freedom this week will take on thorny issues including the following:

- Defining limits in borderless "cyberspace"
- Balancing computer security with the free flow of information
- Safeguarding individual privacy in the face of instant-recall technology

This week, the Palo Alto, Calif.-based Computer Professionals for Social Responsibility (CPSR) association will begin working to clear away the haze when it sponsors the first annual Conference on Computers, Privacy and Freedom, at which hackers, police officers and scholars will come together in an attempt to determine exactly how free speech can be expressed in bits and bytes. The gathering has the potential to set fundamental directions in such areas as balancing computer security with a free flow of information and maintaining the right of individual privacy in the face of instant-recall technology.

"The problems involving the increased computerization of society are somewhat analogous to those that occurred with the advent of the automobile," said Eli Noam, a conference speaker who serves as director of the Center for Telecommunications and Information Studies at Columbia University in New York. "The car was a wonderful thing until we discovered that it produced something called pollution. Then we had to do something about it, or we were going to choke on its fumes."

From one perspective, the electronic age represents democracy in all its glory. It is no longer necessary to own a printing press and "publish" documents in the old sense of the word; information is now launched thousands of miles in all directions at the click of a keyboard. PC users can dial into hundreds of on-line bulletin boards and read opinion pieces, sell their old cars or tap into ongoing conversations dealing with everything from sexual kinks to the price of treasury bonds.

Continued on page 79

Laying down the law

Realizing that this technological genie can never be put back in its bottle, many people believe that education is the only solution. "There only exists an electronic frontier in that there are few regulations and policies that are well-understood and well-designed," said Jim Warren, an industry veteran who will chair the four-day Conference on Computers, Privacy and Freedom. Legal experts concur. "I've talked to judges who say their education [regarding electronic media] comes not from reading books or going to classes but from attorneys in court," said Donn Parker, a security consultant at SRI International.

Others note that information that flits unseen across wires, beams of light and radio waves has outrun the traditional rules of law. "A whole lot of jurisdictional law is based on borders, but borders don't matter anymore," adds Don Ingraham, an assistant attorney in charge of the High Tech Crime Team in the Alameda County District Attorney's Office in Oakland, Calif.

Telecommunications fraud, for instance, transcends state lines and federal and state jurisdiction. The result is that the rules are sometimes written while the game is being played. For instance, the federal government may pursue its Operation Sundevil case as one enormous prosecution, requiring unparalleled cooperation from state and local law enforcers, or it may handle the investigation on a regional basis. That decision is still being made, according to Gail Thackeray, the former Arizona assistant attorney general who directed the state's participation in the operation.

JAMES DALY

Sun branches out, spins off pair of subsidiaries

BY J. A. SAVAGE
CW STAFF

No longer an upstart start-up but a $3 billion company that is trying to preserve its entrepreneurial roots, Sun Microsystems, Inc. will have two new subsidiaries operating by July: Sunsoft, Inc. and Suntech Enterprises, Inc.

Sunsoft was chartered to promote system software for licensing to third parties rather than hoarding it within the Sun fold as a means of "adding value" to Sun workstations. Suntech was commissioned to ensure that non-workstation areas of endeavor, such as printers, compilers and multimedia applications, all become profitable or at least pay for themselves in the long run.

"Sunsoft's product line is like the foundation and framework of a house," President Ed Zander said. "Suntech's is like what color you're going to paint it and what kind of furniture you'll put in it."

Sun will continue to be responsible for workstation hardware; disk, tape and add-in memory; and applications.

"It's not clear you do this to make zillions of dollars," Zander said. Instead, the idea is to proliferate the Sun operating system and make it easier for clone and compatible makers to license system software.

Zander said the arms-length relationship between Sun and Sunsoft would put companies that intend to compete with Sun more at ease. "If I were a competitor of Sun and I wanted to buy Sun's operating system but had to walk into Sun in order to do it," he said, "that makes an uncomfortable selling relationship."

Prior to the creation of Sunsoft, Sun's strategy was to keep some of its system software, such as network management, to itself to provide added value for its own machines.

Zander will head Sunsoft, a new Sun subsidiary

"But that became an endless can of worms [in internal discussions], so we finally decided that there should be a way for compatibles to get equal footing," said Bill Keating, director of corporate technology marketing at Sun. "Basically, we won't have value-added software [now]," he added.

Eric Schmidt, president of Suntech, appears to have a more difficult mission in that the Suntech products must be shown to pay for themselves or risk being cut. "I don't have anyone else to fund me," he said. However, he added, "even though it sounds terrifying, it's not that bad."

For one thing, he noted, under the new subsidiary structure, Suntech's product lines will be sold by a dedicated sales and marketing force for the first time. This should make it easier to get to the bottom line, according to Schmidt. "Now, most customers don't even know we have a printer," he said.

"Our sales force doesn't bother with [system software, networking and peripherals] by and large," Zander added. "Our salesmen are computer guys."

The announcement of the new companies came only a couple of months after discussions first began, according to officials. "We're very unpredictable," Zander said. "We don't let the organization get in the way."

Details are still being worked out, and staff members have yet to move into centralized quarters.

German DP trade deficit rises

Computer industry urged to 'regain its export potential'

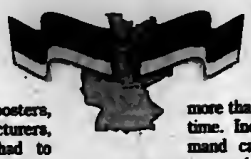
IDG NEWS SERVICE
Special to CW

HANNOVER, Germany — The German data processing industry's foreign trade deficit soared to a record high of about $45 billion in 1990 — a trend that is expected to continue. That deficit could well reach $5.7 billion in the current year, according to the German Federal Association of Office and Information Systems (BVB).

BVB Chairman Rudi Haeussler urged the computer industry to increase its efforts to make Germany internationally competitive in this area if it is to remain strong in the world computer market.

Germany "has to regain its export potential in order not to fall technologically and economically further behind competition from the Far East, the U.S. and other European neighbors," Haeussler said. High salaries and short work hours have already caused the country to fall behind.

Aside from the disproportionate relationship between imports and exports, Haeussler said, 1990 was a good year for the German office, information and communications industries. "Based on the figures calculated for the first three quarters of 1990, the sector has grown by about 10% and topped the $50 million turnover mark for the first time," he said.



Production value increased 6.2% to $21.7 billion. Software and services were the predominant growth boosters, while hardware manufacturers, facing cost barriers, had to struggle to adjust to the market.

The office equipment sector grew between 15% and 20% in 1990, mainly because of market expansion into the former East Germany. "We were surprised that this sector out of all the others profited the most from the new German states," Haeussler said. The move into eastern Germany also helped software houses, training institutes and telecommunications vendors grow.

The BVB reported that production in terms of value climbed from 10% to 15% to more than $10 billion for the first time. Increases in domestic demand caused primarily by the enormous need for a modern telecommunications infrastructure in eastern Germany have, however, cast a shadow on the value of exports, which are expected to decline for the first time, according to the BVB. The computer industry, however, did not profit significantly from the arrival of the new German states. "We misjudged the demand for computers in eastern Germany," Haeussler said.

Although there is interest in inexpensive, generic personal computers, the former East Germany has been reticent about mainframes and minicomputers, Haeussler noted. But even if the information technology sector grows this year to $10.5 billion after last year's decline of almost 6%, about 7% market growth will come from imports. Haeussler said he expects the professional PC sector to struggle the most.

Price cuts of up to 30% were expected with the conclusion of Cebit last week, according to Far Eastern manufacturers. According to Haeussler, these price reductions will make the already difficult market adjustment process that most manufacturers are currently experiencing even more difficult.

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TEXAS INSTRUMENTS

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DG co-founder joins Edsun Labs

WALTHAM, Mass. — Edson de Castro, co-founder and former chairman of Data General Corp., has joined the board of directors of Edsun Laboratories, Inc., a privately held company that specializes in developing graphic enhancement technologies and products for the personal computer environment.

Gordon Hoffstein, Edsun's president and chief executive officer, said that he was "absolutely delighted" to have de Castro join the board.

De Castro *joins Edsun's board*

"I greatly admire his business talent and acumen. Castro will provide an excellent balance to Edsun's board as well as to the company as a whole."

Hoffstein recently joined Edsun after leaving Microamerica, Inc., a major distributor of microcomputer products that he founded in 1979. De Castro will join Steven Edelson, Edsun's founder and chairman of the board, in providing engineering insight for future graphics product development, according to the company.

The company maintains a regional sales office in California as well as a worldwide network of distributors and agents.

Frontier

CONTINUED FROM PAGE 77

To others, it is a breeding ground for outlaws like Kevin David Mitnik. Prior to being jailed, Mitnik was, by all accounts, a dangerous guy with a computer [CW, Jan. 1, 1989]. He reportedly tapped into data banks and destroyed information, altered credit reports and disconnected the phones of celebrities. His most famous exploit, electronically breaking into the North American Defense Command in Colorado Springs, reportedly inspired the movie *War Games*.

When dealing with today's technological wizardry, the Bill of Rights has come to mean different things to different people. It was written in the age of quill pens, long before information could be disseminated without physical form over copper wire or microwaves — a realm that writer William Gibson dubbed "cyberspace."

The result is that integration of civil rights and jurisprudence in the computer age has sometimes been clumsy, at least on the federal level. Last March, the U.S. Secret Service raided the Austin, Texas, home of Steve Jackson, who publishes numerous role-playing games. The agents seized computers they said contained a "handbook of computer crime." The handbook was, in fact, a rule book for a role-playing game. Jackson was not charged with any crime, but he said the government held his computers for nearly four months and the $125,000 he lost in sales put him close to bankruptcy.

Two months later, more than 150 Secret Service agents and prosecutors in Phoenix announced 28 new raids under Operation Sundevil. Although its primary focus was credit-card and telephone access code abuse, the nationwide dragnet shut down several on-line bulletin boards and seized 40 computers and 23,000 floppy disks. Indictments are reportedly in the works, but so far, the raids have yielded little except a lawsuit by the CPSR attempting to compel the Secret Service to reveal the investigation's standing.

Danger on the horizon

Some computer users took a look at the likes of Operation Sundevil and the Steve Jackson affair and believed they had spotted an ungainly beast crashing through an unfamiliar and hazy territory. The result was the Electronic Frontier Foundation (EFF), an organization designed to provide the legal armor necessary to apply First and Fourth Amendment protection to computer users. "We were looking at something that was big and ugly and going to blow up if we weren't careful how it got managed," said John Perry Barlow, cofounder of the EFF. "We want to create a culture and an environment that is free and open and characterized by its liberties rather than its limitations."

Barlow maintains that the EFF is not a safe house for hackers but that it wants the promise of basic liberties extended to a vast, unmapped and untamed landscape that spawns both outlaws and vigilantes.

Lawmen said the frontier analogy is farfetched. "Like the American West, there were people on this frontier long before the wild and woolly Europeans invaded," said Donn Parker, a security consultant at SRI International in Menlo Park, Calif. "The rules to the game are well-established; comparing the electronic community to the wild West is ridiculous."

EXECUTIVE CORNER

Alliant veteran fills CEO post

A management succession plan put into effect last year has boosted **Alliant Computer Systems Corp.** veteran **Craig J. Mundie** into the office of chief executive officer. Mundie, who has been with Alliant since the firm's founding in 1982, has served as president and chief operating officer since July. As CEO, Mundie replaces **Ronald H. Gruner**, who also served as vice-chairman prior to his resignation from the company last month.

The most recent in what appears to be a series of promotional announcements from Waltham, Mass.-based **AI Corp.** shows the knowledge-based management systems supplier expanding in directions both geographical and technological. **Dan Schmidt**, a 13-year veteran of Management Science America, Inc. who most recently headed up international operations for the former software firm (now merged into Dun & Bradstreet Software), has joined AI Corp. as president of AI Corp. Europe and vice president of international operations. Walt Simpson, former director of product marketing at Commodore Business Machines, Inc. is the new director of PC Business at AI Corp.; David Riley brings his 12 years of software industry experience to his new post as the firm's director of Digital Equipment VAX Business.

Tudayasu Sugita, former general manager of the Personal Systems Division of Fujitsu Ltd., recently became COO of Santa Clara, Calif.-based portable computer company **Poqet Computer Corp.** Fujitsu holds a stake in privately owned 3-year-old Poqet, along with the firm's founders and employees. At his new post, Sugita "will focus on the development and engineering of future products and continue coordinating engineering efforts between Poqet and Fujitsu," according to Poqet CEO Robb Wilmot.

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A USER'S CHALLENGE:

A telecommunications company recently faced a budget dilemma that was forcing its IS executives to look beyond IBM for its next mainframe. With several System/3090s installed, the company's IS management did not want to add an IBM-compatible CPU supplier. It was especially worried about the impact a different mainframe — with its new people, procedures and culture — might have on the operations and systems development groups. To close the million-dollar gap that existed between a new 3090 and the non-IBM alternative, the company turned to the quiet, invisible and reliable Cambex solution. It replaced over a gigabyte of IBM 3090 memory with Cambex STOR/9000 central and expanded memory cards, and was able to generate more than enough funds to buy another 3090. Find out more about this clever user from your local Cambex sales representative.

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INTERNATIONAL BRIEFS

Merge and conquer

▶ Eyeing major expansion throughout the North American information services market, Toronto-based **Westbridge Computer Corp.** and neighboring **STM Systems Corp.** announced a stock-swap merger last week. In addition, the firms simultaneously announced the forthcoming combined firm's first alliance: an agreement with **IBM Canada Ltd.** under which IBM will become a stakeholder and business partner of the merged corporation. Final details of the agreement, financial and otherwise, were not disclosed. Some of these gaps will be filled in when the deal closes, according to Westbridge and STM.

Asian ad-ventures

▶ Japanese giant **Mitsubishi Corp.** and New York-based venture capital firm **Hambro International Equity Partners** have joined forces to launch a $150 million venture capital fund aimed at helping U.S.-based start-ups market in Asia. According to a recent report in the U.S. financial press, Hambro will target and evaluate candidates for funding assistance, while Mitsubishi will open up its vast access route to a panoply of resources.

Sense of security

▶ Information technology security is due for a climb up the priority list in **France**, according to recent reports in the French business press. Why? One compelling reason might be found in a recent study issued by French consulting firm **PSI**, which revealed that French companies spent a total of $950 million on information systems security last year and lost an estimated $1.6 billion because of computer accidents, error and fraud.

Video alliance

▶ Cebit, the huge information industry trade show held in Hannover, Germany, served as the setting for **Siemens Private Communications Systems'** mid-month announcement that it has extended its PBX and Computer Teaming (PACT) alliance program to video communication companies. Siemens sealed its PACT addition by signing up two new allies: Maidenhead, England-based **GPT Video Systems** and Peabody, Mass.-based **Picturetel Corp.**

A hand in Japan

▶ **Data General Corp.** has agreed to sell its Japanese subsidiary, **Nippon Data General**, to Kyoto, Japan-based electronics company **Omron Corp.**, the firm announced earlier this month. The deal, valued at approximately $46 million, will not sever DG's ties in Japan, the company said. Nippon Data General, which will retain its original parent company's name, will also become DG's exclusive Japanese distributor.

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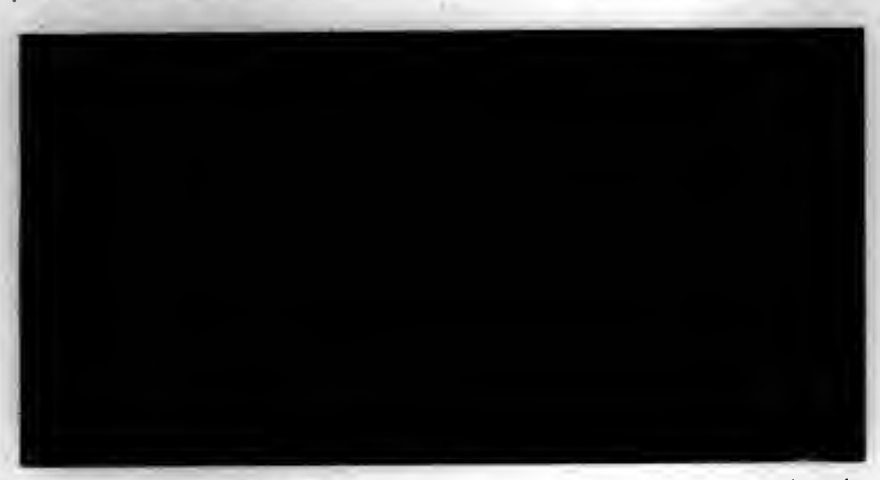

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IBM taps B&B for CICS monitor

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — As the next generation of Enterprise System/9000s approaches, IBM has to learn what many firms in the Unix and Digital Equipment Corp. markets already know: how to enable machines to share data through "loosely coupled" clusters.

To speed the process, IBM early this winter tapped Boole & Babbage, Inc., the 24-year-old systems utilities firm, to work with IBM's CICS engineers in Hursley, England. The joint development project is well under way, said Jack van Kinsbergen, chief technical officer at Boole & Babbage here.

Within two years, Boole & Babbage hopes to have aided IBM's development of a CICS teleprocessing monitor that coordinates computing tasks among multiple IBM processors.

Boole & Babbage's technology would give IBM users a way to "view" their applications in action, said Jeff Schulman, an analyst at Stamford, Conn.-based Gartner Group, Inc.

"IBM is suggesting that they start splitting their applications across multiple hardware platforms, but you can't distribute applications unless you've got the management tools in place," Schulman said. "Boole is integrating its performance management products around an application view rather than a platform view."

IBM has already taken the first steps toward such a client/server architecture, industry analysts said, by introducing OS/2 versions of CICS for desktop computers. But Boole & Babbage's software should allow for greater integration between the desktop transactions and those on the host mainframe computer, according to Alan Snitkoff, an analyst at New Science Associates, Inc. in Southport, Conn.

"This collaboration gives IBM a foundation for starting to distribute applications [once] confined to an MVS processor," Snitkoff said. "[Boole] is one of the independent software firms that will help IBM build products that fill in the holes in IBM's Systemview scheme."

Want overseas work? Better be flexible

BY KIM S. NASH
CW STAFF

In 1987, Ron Landry watched Indonesian workers clear away jungle growth with machetes and wished he could use the same method to dispose of the thick tangle of government regulations blocking completion of his company's planned data processing operation.

Frustration never won out, however. Instead, Landry, director of MIS at Freeport-McMoran, Inc., a New Orleans-based mining firm, spent two years cultivating local contacts and applying cultural understanding and a heap of patience to getting the facility up and running in Tembagapura, or "Copper Town" — a city built by Freeport from nothing but jungle.

Cultural flexibility is an increasingly valuable skill at a time when many businesses are setting up divisions or constructing alliances with partners in foreign countries. With the planned uniting of the European Economic Community in 1992 and the emergence of Asia as a business hub, international know-how has become a major career asset, says Steve Fogle, director of research for Korn/Ferry International's northwest region.

Fogle has seen a jump in the number of requests for information systems people with an overseas background, especially during the past three years. Resumes that mention work performed abroad are pushed to the top of the pile in today's job market, he says. People who have worked abroad can "most definitely command higher salaries," he adds.

Local point of view

Although most foreign assignments are not quite as tough as Landry's, most demand flexibility, patience and the ability to appreciate the local point of view. Not only are the laws governing business and technology different overseas, but foreign countries rarely apply technology in the same way Americans do.

"Anyone who's had such experience is better positioned to sift through the words of foreign colleagues in order to understand what they're really saying," says Rex Schemerhorn, manager of IS at Diamond Star Motors Corp. in Normal, Ill. Jointly owned by Chrysler Corp. and Japan's Mitsubishi Motor Corp., Diamond Star has kept Schemerhorn continent-hopping from here to Asia and back since he was hired in January 1987. He spends most of his time overseas in Tokyo and Nagoya, Japan.

Overseas experience isn't only a ticket to additional foreign postings; it can also pay off in terms of job responsibilities in the U.S. Landry, for example, says he is now asked to participate in major corporate restructuring decisions. "When we're looking to establish foreign businesses, IS considerations are being placed on the same level as financial, legal and political issues," he says.

With the right credentials, it is sometimes not even necessary to write a resume: Jobs come looking for you.

Pete Bates, former manager of information technology at Raychem, Inc., a multinational wire and cable parts-making company in Menlo Park, Calif., was recruited in March 1990 by Businessland, Inc., largely because of his IS experience in Western Europe, he says.

Now vice president of information services at Businessland, Bates says his knowledge of which technologies are feasible in which foreign countries made him attractive to the computer retailer. Businessland plans to expand current operations in the UK, Germany, Canada and Japan and eventually move further into the Far East, Bates adds.

"What intrigued the company most was that I had helped architect a complete data communications plan at Raychem instead of solving individual problems as they arose," Bates says.

Indeed, companies are not looking for a lot of stamps in a passport book: They are looking for the kind of sustained experience in one or a few countries that makes an individual fluent in the nuances of local business norms. IS success often depends on familiarity with and effective application of local customs. This is tricky, however, because business norms differ between countries and across oceans.

"When you talk to a CEO in Denmark, you use his first name, but in Germany, everyone — no matter his position — is Herr This or Frau That," says Jim Venske, the program director at NCR Corp.'s Europe Group. Venske has lived and worked in Western Europe for four years.

Motivating factors

Venske also discovered during his first job in Europe, when he was support manager at a data communications group in Sweden, that motivating Swedish workers requires more creative techniques than he might have used in the U.S., where money talks.

Scandinavian countries have high income tax rates — the rate was between 72% and 78% in Sweden at the time — so the prospect of a bonus or raise did not make IS workers buckle down, Venske says. He had to find other carrots to dangle, including company-leased cars and portable computers to induce his team to work the long hours required to meet deadlines.

Venske, who is now a consultant and project leader at NCR's Systems Integration Technology Center in Frankfurt, says other problems can stem from what he calls the "Ugly American" syndrome. Some Americans expect to remake Europe into another U.S., he explains, "getting mad when the rest of the world does not function like the States, which is not a good way to build contacts." Venske emphasizes that Americans should try to fit in with local residents and customs.

The kind of firm you work for and the length of overseas service can affect career growth. According to Fogle, multinational companies tend to be more interested in IS workers from high-visibility companies where they have likely had the opportunity to glean deeper and more varied experiences with international technology issues.

In addition, having worked in Europe does not necessarily prepare people for working in other parts of the world, particularly Asia, where local residents can be less receptive to American transfers than other nations, Fogle says. Like Americans, Japanese have a penchant for nationalism and privacy and will not generally hire U.S. transfers, he says.

Nash is a *Computerworld* researcher/writer, features.

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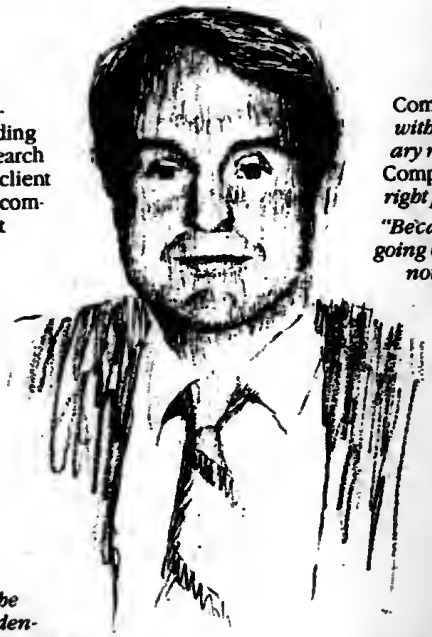

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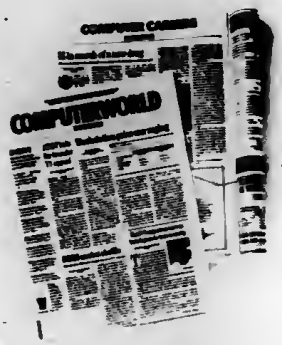

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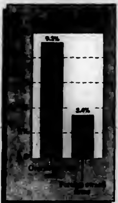
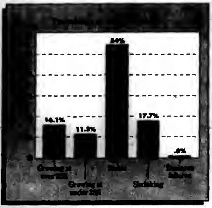
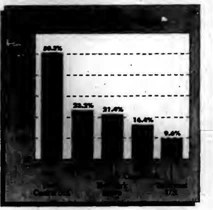
Computerworld/CorpTech Career Index

More than one-quarter of small- and medium-sized firms involved in the banking software industry are experiencing employment growth, particularly in the South Central U.S., based on a survey of 124 bank software manufacturers







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Software Engineer for research, development and mfg. firm in NE Ohio, to design, implement and maintain the DATABASE system used for medical image processing software and hardware system that includes development and implement of functions concerned with data access and process from or to database. Other duties also include supporting software for medical image display, error login and reporting, designing data archiving system while using secondary medium data storage devices (such as tape and optical disk). Educational requirement is an M.S. in Computer Science or Engineering with graduate level courses in Computer Algorithm, Database management system and one undergraduate or graduate level course in Computer Graphics. Must have 2 years experience in the design, development and implementation of relational Database system, that includes using C language under UNIX operating system. 40hrs/wk, 8am-5pm, Mon-Fri, $35,607/year. Must have proof of legal authority to work permanently in U.S. Send resume in duplicate (no calls) to S. HOLTON, JO# [illegible], Ohio Bureau of Employment Services, PO Box 1618, Columbus OH 43216.

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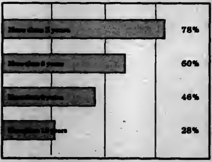

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Protect the source code of software investments

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY DENNIS S. DEUTSCH
SPECIAL TO CW

Nothing in life is certain, and that includes the business stability of software vendors. There is, however, a legal mechanism for protecting yourself and your company from the worst fallout of a software provider's failure or disappearance. This protective device is called a source-code escrow agreement, and it provides a means for a software purchaser to obtain a copy of program source code should a vendor go out of business.

Software source code is the program before it is compiled into a language that the computer can understand. As such, source code is needed to fix bugs, modify the software or write upgrade programs that will improve the application's functionality or efficiency. Without source code — although the program may be modified — systems staff will waste a lot of valuable time and money trying to upgrade programs and fix bugs.

A source-code escrow works this way: When buyers sign license agreements, they place the software source code in escrow at the same time. Escrow simply means in the possession of a third party (bank, attorney or other), which is neither the vendor nor the user. If the vendor files for bankruptcy, the user can write to the bankruptcy trustee electing to have the source code removed from escrow. The third party will then return the source code to the purchaser so that he can continue to maintain and upgrade the software.

Clearly, protecting software assets in this way is important, particularly in times of economic uncertainty. Unfortunately, probably no more than half of the IS community even knows about source-code escrow agreements and even fewer — maybe 25% or 30% — have ever used one.

No legal contract is ever simple. However, source-code escrow agreements are relatively easy to construct and enforce, if you keep a few essentials in mind. Following are some of the most important elements of an agreement:

- **Get it in writing.**

Do not rely on oral contracts for source-code escrow agreements. Sometimes, vendors will say the software source code will be available to you because it has already been placed in escrow. However, the bankruptcy trustee will demand to see a written agreement between you and the vendor before a copy of the escrowed source code is handed to you.

- **Check the content.**

Verify that the source code placed into escrow contains the source code for your program. Don't wait to find out that the code in escrow is a "Pac Man" program. The right to verify the escrowed source code must be written into the agreement. Most often, either verification is performed by a third party hired by the user or the verification is provided for a fee as a service by the escrow agent.

- **Provide for the future.**

Make provisions in the contract for regular updating of the escrowed source code. This is an essential step because all software will be upgraded and modified at some point. Consider what value the original source code to Release 1.0 would be to you if you are using Release 4.0 at the time of the vendor's bankruptcy. In addition to making provisions in your agreement for the escrowing of later versions, your contract must provide for independent verification with every change of escrowed code.

- **Choose carefully when selecting an escrow agent.**

The third parties that act as escrow agents can be banks, lawyers or private escrow companies. However, third-party agents must be negotiated and agreed to by both parties. If your vendor suggests that you use his attorney, be careful: The attorney will be more loyal to the vendor than to you. In the event of a dispute over the terms of the escrow agreement, you are already at a disadvantage if it is the vendor's attorney who is holding the source code.

There are disadvantages, too, if your lawyer serves as the agent. Although this scenario may seem to be an advantage to you, in the event of a dispute over the escrow agreement, your lawyer is now serving not only you but also the vendor (or its estate) as an agent. Your lawyer may be required to sit on the sidelines while you obtain a new lawyer to represent you in any dispute.

Although probably somewhat more expensive than using a lawyer to simply hold the software, the bank is probably a better alternative. The bank has not established any attorney/client privilege the way lawyers do, which might conflict with its obligations as an escrow agent.

Fees for private firms

You may consider using a private escrow company that deals exclusively with source code. One drawback to these companies is that they charge a fee for the original escrowing, an additional fee each time a new release is escrowed, another fee for the verification of each deposit and an annual fee while the software remains on deposit. To avoid hassles, make it clear in the escrow agreement who is responsible for these fees.

Also, don't rely on the escrow agent's contracts without having your lawyer review them during the software acquisition process. They may not be written adequately to protect the buyer's rights. They are, after all, written by escrow agents' lawyers whose prime interest is in protecting the escrow agent.

The entire software escrow process may appear to be complicated and costly, but consider the alternative: no vendor to support your software and no practical means to maintain or modify it.

Deutsch practices computer law in Hackensack, N.J., and is an adjunct associate professor of law at Fordham University School of Law in New York.

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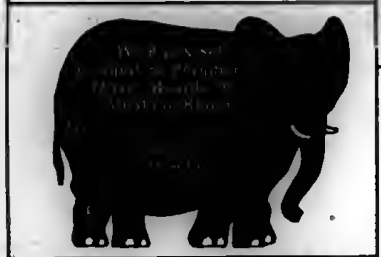

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Closing prices report for the week ending March 15, 1991

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XT Model 089	$550	$625	$400
AT Model 099	$650	$775	$500
AT Model 239	$775	$925	$700
AT Model 339	$925	$1,000	$900
PS/2 Model 30-286	$1,100	$1,300	$1,000
PS/2 Model 60	$1,400	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$3,000
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,350	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,500	$2,200
LTE 286	$2,200	$2,500	$1,900
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,850	$3,000	$2,300
Apple Macintosh Plus	$750	$975	$700
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RFP 1977, due Wed. 4/10/91 at 3:30 p.m. for a trial 486-based multiuser microcomputer system completely compatible with the Banner software from SCT Corp. for the BD. of TRUSTEES OF STATE INS.

RFP 1976, due Thurs. 4/18/91 at 3:30 p.m. for the upgrade of two existing NOVELL/ETHERNET local area networks at the SECRETARY OF STATE'S OFFICE.

RFP 1983, due Thurs. 4/11/91 at 3:30 p.m. for a high-speed optical mark reader/scanner for the Emergency Medical Services Div. of the MS STATE DEPT. OF HEALTH.

RFP 1987, due Tues. 4/16/91 at 3:30 p.m. for equipment to an existing statewide network running the Florida Management Systems software for the MS DEPT. OF HEALTH. Required are 10 multiuser, Unix-based NCR systems or their equivalent & modems, printers & additional software licenses.

RFP 1988, due Thurs. 4/11/91 at 3:30 p.m. for hardware, software, installation services & support necessary to implement a local area network for the UNIVERSITY OF MS.

RFP 1980, due Thurs. 4/11/91 at 3:30 p.m. for a PC-based local area network with four workstations and library software for HINDS COMMUNITY COLLEGE.

Detailed specs may be obtained from the CDPA office. CDPA reserves the right to reject any and all bids and/or proposals and to waive information.

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COMPUTERWORLD
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How to tempt resistant execs to use computers

For starters, keep your training short and sweet

BY SUZANNE WEIXEL
SPECIAL TO CW

To win over a senior executive who refused even to consider learning how to use the same word processing software as the rest of the company, Mary Ann Brink, the end-user computing project leader at the *Minneapolis Star Tribune*, decided to present it to him in a way he couldn't resist: She gift-wrapped the reference manual, adorned it with ribbons and bows and handed it to him.

High-level executives may put their pants on one leg at time like the rest of us, Brink says, but teaching them to use technology poses a different kind of challenge than training the average staff member.

For example, executives come into a technology-oriented training session with a myriad of preconceived ideas that lead to a number of training problems. Many start out afraid of failing in front of their peers or of wasting valuable time, according to Tori Coward, president of Tangent Computer Resources, a training firm in Fort Worth, Texas.

But the challenge isn't impossible. Trainers must be prepared to use different approaches to ensure smoother sailing when training executives. The following are some approaches that have worked:

- Keep the sessions short and flexible.
- Customize the training to suit the individual.
- Conduct the training off-site, away from distractions.
- Give positive feedback.
- Use easy-to-conquer hands-on exercises, which directly relate to the users' jobs.
- Enlist the help of high-level executives who know how to use technology to their advantage and are proud of it.

Tight schedules

Typically, Coward says, the higher up in the organization you go, the less time executives have to spend on training. She recommends limiting each session to half a day in length. However, according to trainers, another problem is the tendency of executives to think they can walk out at any time.

At the *Star Tribune*, executives may show up for regularly scheduled classes but probably won't make it all the way through. "They go out to make a phone call, and they never come back," Brink says.

One way around that problem is to customize the training to suit the individual. "If they want smaller groups or one on one, if they want audio-based training or off-site training, we make it available," says Marilyn Allendorph, MIS education supervisor at American National Can Co. in Chicago.

Another solution some trainers find helpful in keeping executives focused on the task at hand is conducting the training off-site.

At the American Cancer Society, executives are brought to the national training center. Not only are they removed from their usual place of business, but the atmosphere is deliberately more casual than the typical office setting.

The casual atmosphere also helps alleviate anxieties many executives have about using technology. Many are just plain afraid of looking stupid in front of their co-workers, according to Karen Tanner, director of special projects. More than once, an executive has handed one of the trainers a note asking that he not be singled out or embarrassed, she says.

Because many executives equate office technology with something used only by subordinates, it is important to convince them right off the bat that the technology will benefit them. Coward advises trainers to make a point of understanding how the executives will use technology to support their business requirements.

"They come in with a definite attitude. But if you find out ahead of time exactly what they want to gain from the training and then organize the session accordingly, they'll walk out amazed by what they've learned," Coward says.

For instance, she explains, if they see that using Lotus Development Corp.'s 1-2-3 to perform what-if scenarios can enhance their decision-making, they will be eager to learn how.

Seeing the results

At the American Cancer Society, within the first 10 minutes of a word processing session, executives are spell-checking a document that simulates something an assistant might ask them to approve. As soon as they have quick, realistic success, they want more, Tanner says.

According to Allendorph, executives often approach training like an obstacle course. "They try to figure out the easiest way possible to get through it without actually encountering anything that's going to change the status quo," she says. At American National Can, the goal is to make it easy, informative and available.

But making training available to suit the executives may not be enough. At Eastern Maine Healthcare in Bangor, MIS sponsored seminars to convince executives that electronic information could promote productivity gains, but the response was limited. According to Mary Jo MacLaughlin, director of MIS education, the best success they've had in reaching the top levels came from the chief information officer.

"Almost by osmosis, he has converted other executives. They see that he uses project management software, he uses E-mail and other tools that make his life easier, and they want to know more," she says.

Mary Texer, manager of technical training at the Federal Reserve Bank of Minneapolis, also saw interest in technology training soar once the bank president made it clear he was committed to it. After he installed a personal computer on his own desktop, Texer recalls, the training department was swamped with requests.

"Suddenly, waiting two weeks for the next scheduled training class wasn't good enough," Texer says. To accommodate the demand, one-on-one sessions were arranged for each of the 30 or so executives who had PCs.

Weixel is a free-lance writer based in Framingham, Mass.

COMPUTERWORLD

April Training Editorial Topics

1 How do graduates of top IS schools feel about their education and careers? (Part 1 of a two part series)
Industry Closeup: *Information Systems in Transportation*
Integration Strategies: *Integrating Local Area Networks*
Close: March 26

8 What do employers say about graduates of top IS schools?
(Part II of a two part series)
Product Spotlight: *Sales Force Automation*
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO ATTRACTIVE: **Computer Associates International, Inc.** (Mabon, Nugent & Co.). Reason: Management's back-to-basics emphasis on increasing salesmen productivity and enhancing products, combined with growth of international division could push stock price up to $12 range.

UPGRADED FROM NEUTRAL TO STRONG BUY: **Intergraph Corp.** (Alex. Brown & Sons, Inc.). Reason: Firm said it plans to run its software on workstations from Sun Microsystems, Inc. in addition to its proprietary machines; current 9% operating margin should jump to 15% as firm reduces dependency on own platform.

UPGRADED FROM ATTRACTIVE TO BUY: **Sierra On-Line, Inc.** (Mabon, Nugent). Reason: Announced merger with Broderbund, Inc. makes company dominant in entertainment and educational personal computer software market.

DOWNGRADED FROM BUY TO HOLD: **National Semiconductor Corp.** (Prudential Securities, Inc.). Reason: Despite a show of profitability for the third quarter, sales stopped short of estimates; orders for current quarter should improve, but August may see downturn in business.

DOWNGRADED FROM MODERATELY ATTRACTIVE TO NEUTRAL: **Oracle Systems Corp.** (Donaldson, Lufkin & Jenrette Securities Corp.). Reason: U.S. business remains soft, and last quarter's 62% increase in international revenue is not sustainable; banks are tightening lending policies, therefore inhibiting potential customers from financing major Oracle purchases.

DOWNGRADED FROM ATTRACTIVE TO NEUTRAL: **American Management Systems, Inc.** (Paine Webber, Inc.). Reason: Strong business has pushed stock prices above fundamentals; shares now trade at about 20 times earnings-per-share expectations for the 1991 calendar year.

ANALYSIS IN BRIEF

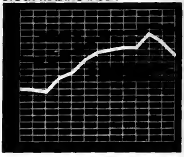
Networking stocks seem resistant to the current recession. They have outperformed other technology sectors during the past six to nine months.

The future looks particularly robust for **Cabletron Systems, Inc., Cisco Systems, Inc., Novell, Inc. and Synoptics Communications, Inc.** because Wall Street watchers have underestimated the earnings potential of these companies. Intelligent hubs, internetworking and network operating systems are hot products now and getting hotter. Plus, buyer interest in networking has increased: Last month's Networld conference drew a record 20,000 attendees, up 25% compared with last year's total. — *Networking Overview, Needham & Co., March 1991.*

Semiconductor stocks have shot up since October 1990 and were recently fueled by February's strong book-to-bill ratio. Because more buyers bought chips last month than analysts expected, stocks that have declined most in the last one to two weeks will likely rebound over the near term. **Altera Corp., Cypress Semiconductor Corp. and Intel Corp.** should climb significantly as they have shown the strongest order patterns in recent months. These three firms are rated "Buy."
— *Semiconductors: Industry Update, Prudential Securities, March 14, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

• Investors jerked IBM's chain, ripping its stock down 16¼ points to 111⅞ by Thursday after IBM warned of a first-quarter profit drop. Quarterly figures are expected the week of April 9.

• IBM's *bad news* stirred the *selling* of *technology* shares. Digital Equipment Corp. fell 8⅝ points to 68⅝; Compaq Computer Corp. and Cray Research, Inc. each lost 3¾ points, closing Thursday at 61⅛ and 37¾, respectively.

• The announcement of disappointing second-quarter financials for Software Publishing Corp. preceded that firm's 10¾-point plunge to 18. Meanwhile, Adobe Systems, Inc. turned heads with healthy first-quarter profits last week, climbing 4¾ points to 51.

• New issue Atmel Corp., a semiconductor company based in San Jose, Calif., offered 4.5 million shares at $13 each on last Tuesday. Atmel closed Thursday up ½ a point at 13½.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, MARCH 22, 1991

TOP PERCENT GAINERS	
EMC Corp.	19.13
Anacomp Inc.	16.67
AST Research Inc.	13.04
Fibronics Int'l Inc.	13.16
Adobe Systems Inc.	11.86

TOP PERCENT LOSERS	
Software Publishing Corp.	-37.85
Businessland Inc.	-19.05
Tandem Computers Inc.	-15.85
Alliant Computer Sys.	-13.07
IBM	-12.88

TOP DOLLAR GAINERS	
Adobe Systems Inc.	6.25
AST Research Inc.	6.00
Bell Atlantic Corp.	2.88
Borland Int'l	2.25
NCR Corp.	1.88

TOP DOLLAR LOSERS	
IBM	-13.50
Software Publishing Corp.	-10.88
Digital Equipment Corp.	-7.88
Matsushita Electronics	-6.25
Motorola Inc.	-5.38

Communications and Network Services — Off 0.70%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
OTC	19.00	5.38	3COM Corp.	8.50	-0.38	-4.23
NYS	69.75	52.88	American Info Techs Corp.	67.88	1.38	2.08
NYS	44.13	29.00	AT&T	33.88	-1.00	-2.88
OTC	3.13	0.69	Ariel Communication Corp.	2.63	-0.13	-4.55
NYS	60.25	60.50	Bell Atlantic Corp.	50.00	2.88	6.13
NYS	57.63	60.00	Bellsouth Corp.	53.00	0.63	1.13
OTC	20.75	8.25	Compression Labs Inc.	20.75	1.25	6.41
NYS	41.25	20.38	Contel Corp.	41.00	0.00	0.00
OTC	3.13	1.38	Data Switch Corp.	4.38	-0.38	-7.89
NYS	26.75	8.88	Digital Comm. Assoc.	17.38	-0.13	-0.71
OTC	25.25	12.25	Dynatech Corp.	19.75	-1.00	-4.82
OTC	12.88	5.00	Fibronics Int'l Inc.	10.38	1.19	12.16
OTC	4.00	1.75	Gandalf Technologies Inc.	3.00	0.13	4.35
NYS	4.00	1.63	General Datacomm Inds.	2.75	0.00	0.00
NYS	34.13	23.50	GTE Corp.	31.75	-1.75	-5.22
OTC	6.25	0.75	Infotron Systems Corp.	1.44	0.03	2.23
NYS	60.88	40.25	ITT Corp.	54.25	-2.38	-4.16
OTC	44.13	17.38	MCI Communications Corp.	25.88	-0.63	-2.38
OTC	21.00	2.75	Microcom Inc.	5.25	0.00	0.00
NYS	32.75	4.00	Network Equipment Tech.	8.13	-0.38	-4.41
OTC	14.63	4.00	Network General	11.25	-0.50	-4.26
OTC	19.50	6.13	Network Systems Corp.	12.63	-0.38	-2.88
NYS	32.00	22.13	Northern Telecom Ltd.	30.88	-1.50	-4.72
OTC	52.75	17.25	Novell Inc.	46.00	0.00	0.00
NYS	80.50	67.00	Nynex Corp.	72.00	-2.75	-3.68
NYS	47.88	36.25	Pacific Telesis Group	42.25	1.88	4.64
ASE	14.50	4.75	Penril Corp.	13.50	-0.75	-5.26
NYS	29.13	8.88	Scientific Atlanta Inc.	16.25	0.38	2.36
NYS	60.38	47.63	Southwestern Bell Corp.	54.13	0.38	0.70
NYS	46.38	20.63	United Telecom	24.00	-1.13	-4.48
NYS	40.75	32.38	U S West Inc.	38.13	1.25	3.30

Computer Systems — Off 3.34%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
OTC	8.75	0.88	Alliant Computer Sys.	1.25	-0.13	-13.07
ASE	16.88	10.00	Amdahl Corp.	14.88	-0.75	-4.92
OTC	70.25	24.25	Apple Computer Inc.	63.25	-2.00	-3.07
OTC	13.38	4.25	Archive Corp.	7.50	0.13	1.69
OTC	69.25	7.88	AST Research Inc.	28.00	6.00	13.04
NYS	7.88	3.88	Bolt, Beranek & Newman	6.75	0.25	3.85
NYS	13.38	4.00	Commodore Int'l	16.13	-1.25	-7.13
NYS	74.25	35.50	Compaq Computer Corp.	60.63	-5.25	-8.08
OTC	3.50	0.13	Computer Automation Inc.	1.06	0.00	0.00
NYS	21.63	8.75	Control Data Corp.	12.00	0.25	2.13
NYS	20.88	4.88	Convex Computer	15.00	-0.75	-4.76
NYS	31.38	20.00	Cray Research Inc.	38.00	-3.50	-8.43
NYS	13.25	3.50	Data General Corp.	12.25	0.13	1.03
NYS	6.88	0.75	Datapoint Corp.	2.88	0.13	4.55
OTC	28.88	7.50	Dell Computer Corp.	26.50	0.38	1.44
NYS	89.13	60.50	Digital Equipment Corp.	69.13	-7.88	-13.25
NYS	38.13	16.75	Harris Corp.	25.00	-1.50	-5.66
NYS	50.63	24.38	Hewlett Packard Co.	47.25	-1.25	-2.56
NYS	139.75	95.25	IBM	111.63	-10.38	-12.88
OTC	14.00	7.75	Information Int'l	8.25	0.25	3.19
OTC	25.75	10.50	Intergraph	24.00	0.00	0.00
NYS	3.13	0.50	MAI Systems Corp.	0.88	0.00	0.00
NYS	149.88	114.38	Matsushita Electronics	128.00	-6.25	[illegible]
OTC	20.00	3.00	Mentor Graphics Corp.	14.50	-0.50	-3.33
NYS	88.25	44.38	NCR Corp.	88.63	1.88	1.88
OTC	35.50	11.00	Pyramid Technology	20.50	-2.13	-9.88
OTC	34.00	6.75	Sequent Computer Sys.	13.75	-0.88	-6.08
NYS	47.25	13.38	Silicon Graphics	40.13	-0.88	-2.13
NYS	60.13	14.63	Stratus Computer Inc.	30.00	-2.75	-8.40
OTC	37.25	13.00	Sun Microsystems Inc.	29.88	-3.50	-10.68
NYS	29.38	8.88	Tandem Computers Inc.	12.50	-2.25	-15.25
NYS	60.50	23.50	Tandy Corp.	31.00	-1.75	-5.34
OTC	33.25	8.75	Teradata	17.50	0.75	4.48
NYS	7.88	1.38	Ultimate Corp.	4.75	-0.25	-5.00
NYS	13.88	1.75	Unisys Corp.	5.38	-0.25	-4.44
ASE	8.00	2.00	Wang Labs Inc. (b)	4.25	-0.13	-2.86

Software & DP Services — Off 2.33%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
OTC	53.50	17.38	Adobe Systems Inc.	51.50	6.25	11.86
OTC	81.25	16.75	Aldus Corp.	68.88	-0.88	-0.75
OTC	24.88	13.00	American Mgmt. Systems	23.00	-0.13	-0.54
OTC	16.25	7.00	American Software Inc.	12.13	-0.88	-4.80
NYS	4.38	1.38	Anacomp Inc.	4.88	0.63	16.67
OTC	23.50	10.00	Analysts Int'l	19.00	1.25	7.46
OTC	13.63	4.88	Ashton Tate	8.13	-0.25	-2.88
OTC	10.25	4.00	ASK Computer Sys.	8.00	-0.25	-3.03
NYS	57.00	46.25	Auto Data Processing	60.88	-1.50	-2.40
OTC	60.25	32.00	Autodesk Inc.	48.25	1.00	6.12
OTC	31.50	12.25	BGS Systems Inc.	30.00	-0.25	-0.83
OTC	43.88	17.75	BMC Software Inc.	40.00	-1.00	-2.44
OTC	21.50	11.00	Boole & Babbage Inc.	15.25	0.25	1.67
OTC	56.50	14.00	Borland Int'l	48.50	2.25	4.86
NYS	11.88	0.88	Businessland Inc.	2.13	-0.50	-19.05
OTC	16.63	5.00	Cognos Inc.	14.38	-0.75	-4.80
NYS	16.88	4.38	Computer Associates	8.88	-1.38	-10.81
OTC	17.75	7.75	Computer Horizons	13.25	1.00	8.16
NYS	64.00	38.75	Computer Sciences	60.00	-1.50	-2.44
NYS	11.75	6.63	Computer Task Group	10.50	-0.13	-1.18
OTC	25.25	13.00	Comshare Inc.	20.00	-0.50	-2.44
OTC	16.00	6.75	Corporate Software	11.38	0.13	1.11
NYS	47.00	27.38	General Motors E (EDS)	38.75	-4.38	-9.92
OTC	16.75	7.25	Goal Systems Int'l	16.50	-1.00	-6.06
OTC	4.75	1.38	Hogan Systems Inc.	4.88	0.50	3.88
OTC	12.00	3.00	Index Technology	10.25	-0.75	-6.82
OTC	19.13	7.75	Information Resources	17.75	3.38	6.19
OTC	17.50	2.63	Informix Corp.	5.63	-0.25	-4.25
OTC	7.88	1.38	Intelligent Inc.	2.25	-0.31	-12.21
OTC	6.00	2.50	Interleaf Inc.	5.75	-0.63	-9.80
OTC	40.00	10.00	Knowledgeware Inc.	36.00	-1.38	-3.68
OTC	45.00	13.75	Legent Corp.	39.50	-0.25	-0.63
OTC	39.25	12.50	Lotus Development	24.75	-1.13	-4.35
OTC	32.00	13.63	Micrografx	20.63	0.25	1.85
OTC	113.00	60.75	Microsoft Corp.	93.75	-4.25	-4.34
NYS	10.50	4.00	On Line Software Int'l	3.75	-0.38	-9.70
OTC	60.88	4.88	Oracle Systems	9.00	-0.50	-5.26
NYS	17.00	7.00	Panasophic Systems	10.75	-0.25	-2.27
OTC	7.88	1.25	Phoenix Technologies	7.88	-0.50	-6.20
NYS	62.00	31.63	Policy Management Sys.	48.25	0.25	0.52
NYS	23.00	11.50	Reynolds & Reynolds	18.00	-1.13	-5.88
OTC	16.13	6.88	Sage Software Inc.	10.25	-0.50	-4.65
OTC	25.50	14.75	SEI Corp.	24.63	-0.13	-0.51
OTC	18.13	12.25	Shared Medical Systems	16.63	0.25	1.53
OTC	35.25	13.00	Software Publishing Corp.	17.88	-10.88	-37.83
NYS	13.25	5.50	Sterling Software	12.63	-0.13	-0.98
OTC	08.00	8.50	Sungard Data Sys.	16.50	0.75	5.00
OTC	68.60	17.75	Symantec Corp.	44.75	1.75	4.07
NYS	24.50	4.50	System Center Inc.	7.00	-1.00	-10.50
OTC	37.25	12.75	System Software Assoc.	20.25	-0.75	-3.57
OTC	27.88	4.75	[illegible]	13.00	[illegible]	[illegible]

Semiconductors — Off 5.27%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
NYS	25.88	19.38	Advanced Micro Devices	21.25	-0.75	-3.41
NYS	11.88	5.50	Analog Devices Inc.	10.88	0.13	1.19
OTC	21.75	5.25	Chips & Technologies	10.30	-0.50	-4.88
OTC	52.75	28.00	Intel Corp.	43.75	-3.75	-7.88
NYS	13.00	5.13	LSI Logic Corp.	6.88	-0.25	-0.74
NYS	17.38	6.75	Micron Technology	16.00	-0.75	-4.48
NYS	88.38	45.75	Motorola Inc.	57.25	-5.38	-8.58
NYS	8.63	3.00	National Semiconductor	7.13	-0.50	-6.56
NYS	69.75	22.50	Texas Instruments	37.50	-4.88	-11.50
OTC	12.25	3.00	VLSI Technology	6.25	-0.38	-4.88
ASE	14.88	4.00	Western Digital Corp.	4.88	-0.88	-8.13

Peripherals & Subsystems — Off 1.92%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
OTC	1.38	0.09	Alloy Computer Prod.	0.75	0.00	0.00
OTC	2.25	0.88	Aperture Technologies	1.94	0.00	0.00
OTC	24.00	7.00	Banctec Inc.	12.13	0.38	3.13
ASE	10.88	4.13	Cognitronics Corp.	10.25	0.88	8.33
NYS	21.25	14.63	Conner Peripherals	24.50	-2.00	-7.88
ASE	22.00	7.00	Dataram Corp.	11.00	-0.25	-2.22
NYS	10.88	4.88	EMC Corp.	10.13	1.63	19.12
NYS	47.25	93.75	Eastman Kodak Co.	43.13	-2.00	-4.43
OTC	8.88	4.38	Emulex Corp.	3.88	0.08	2.90
OTC	24.50	14.00	Evans & Sutherland	19.50	3.00	0.00
OTC	6.50	0.75	Iomega Corp.	5.88	-0.31	-5.50
OTC	28.25	8.75	IPL Systems Inc.	22.75	-2.75	-13.75
OTC	1.94	0.13	Masstor Systems	0.88	-0.08	-8.27
OTC	17.00	2.63	Maxtor Corp.	5.00	-0.58	-11.11
OTC	13.38	3.88	Micropolis Corp.	11.63	0.38	3.33
NYS	93.75	73.63	3M Corp.	87.88	-4.00	-4.88
OTC	14.50	4.00	Printronix Inc.	8.88	-0.13	-1.38
NYS	21.25	8.88	QMS Inc.	19.00	0.00	0.00
OTC	27.25	12.38	Quantum Corp.	23.50	-1.88	-5.53
NYS	8.13	4.38	Recognition Equipment	3.83	0.10	2.27
OTC	8.88	4.00	Rexon Inc.	6.13	-0.88	-5.30
OTC	17.88	3.50	Seagate Technology	14.13	-1.00	-6.61
NYS	35.25	11.00	Storage Technology	30.00	-1.50	-4.75
OTC	4.00	1.25	Tandon Corp.	3.25	-0.08	-7.14
NYS	23.00	11.63	Tektronix Inc.	22.50	0.75	8.05
OTC	0.63	0.10	Televideo Systems	0.41	-0.03	-7.31
NYS	58.25	28.00	Xerox Corp.	53.50	-3.63	-4.88

Leasing Companies — Off 1.85%

Exch	52-Week	Range		March 22 Close	Wk Net Change	Wk Pct Change
OTC	16.00	8.88	Amplicon Inc.	16.00	0.25	1.88
OTC	4.88	0.31	Capital Associates	0.88	-0.00	-8.08
NYS	29.88	14.63	Comdisco Inc.	24.88	-1.00	-3.88
OTC	13.88	3.25	LDI Corporation	13.50	-0.25	-1.85
OTC	5.88	0.05	Selectarm Inc.	4.00	0.25	6.67

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DEC pumps up fault-tolerant challenge

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — The lonely existence of Digital Equipment Corp.'a fault-tolerant VAXft 3000 changed abruptly last week with the rollout of four new family members ranging in price from $46,950 to $1 million.

The move stocks DEC's arsenal for a market share showdown with the leading vendors of crash-proof computing: Tandem Computers, Inc. and Stratus Computer, Inc. Yet it is clearly Tandem's high-end customers that hold the greatest allure for DEC, industry analysts said.

Researchers at Gartner Group/Infocorp predict DEC will garner 20% of the fault-tolerant computing market by 1995 — a notable shift from its current insignificant status. "The net market will increase because DEC is in it," said Sandra Gant, a Gartner Group/Infocorp analyst. "A lot of people DEC is going to sell to — like VAX/VMS customers or independent software vendors — would not have bought Tandem or Stratus in the first place."

DEC is pitching its VAXft systems as ideal front-end processors for large Vaxclusters in a strategy to "bulletproof" system reliability and enable it to crank out 500 to 1,000 transactions per second once the fault-tolerant VAX has the combined processing power of the cluster behind it.

On their own, the VAXft systems can produce only six to 25 transactions per second which is inadequate for large-scale online transaction processing. The four VAXft 3000 systems come in 11 different configurations and run the VAX/VMS operating system. They all contain the same CPU architecture, borrowed from the Microvax 3800 for the VAXft 3000 Model 310, but a faster processing chip was used to boost speed.

"If we were going to go with fault tolerance, our first applications would be as a user front end. As we get more and more remote sites, we would like to have a way to assure fault tolerance there," said Larry Stiefvater, a researcher at Kraft General Foods Research Technology Center in Glenview, Ill. "At this point, we don't need one, though. Our cluster is very reliable, and DEC has continually improved cluster features."

To some users, however, the power of the VAXft systems is stillless than impressive.

"That Model 110 is far too expensive for the VUPS [units of processing power] you get. I can do a similar job with twin Microvax 3100s and get the same power," said Hal Kolp, information systems operations manager at National Semiconductor Corp. in South Portland, Maine, a manufacturing location for the Santa Clara, Calif.-based firm.

The weakness in DEC's strategy will show up in software rather than hardware, users and analysts said.

"Your system is only as fault-tolerant as the software that runs on it," said Peter Corisasco, vice president of Profitco Operations Strategic Planning at Banker's Trust Co. in New York.

"A VAX 6400 cluster is extremely reliable, and it costs a lot less money," he added.

Included in last week's announcement was the limited availability of "disaster-tolerant" Vaxclusters utilizing Fiber Distributed Data Interface to share data between systems up to 40 km apart. A single cluster could be located in both New York City and New Jersey, for example, with data safely duplicated both locally and at the remote site.

Tolerant-minded

DEC expanded its fault-tolerant offerings beyond the 1-year-old Model 310 with four new models

VAXft series

Model	110	410	610	612
Performance				
VUPs*	2.4	6	6	12
Trans./sec.	6	16	16	25
Maximum memory	96M bytes	128M bytes	128M bytes	128M bytes
Price	$46,950-$69,950	$145,077-$550,000	$144,875-$750,000	$275,547-$1 million
Availability	120 days after order	June '91	July '91	July '91

*VAX units of performance

Source: Digital Equipment Corp.

CW Chart: Doreen St. John

Stratus RISC machine debuts with dual operating system

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Stratus Computer, Inc. trotted out the industry's first fault-tolerant computer based on reduced instruction set computing (RISC) last week, with the unexpected flourish of dual operating systems.

The XA/R Model 20, based on the Intel Corp. I860 RISC microprocessor, will run either Stratus' proprietary VOS operating systems or its FTX Unix system. All current VOS applications can be recompiled to run on the new RISC platform without rewriting code.

The XA/R Model 20 is the first in a line of RISC systems Stratus is planning to unveil during the next two years as it migrates its customers to the new platform.

"This is definitely a reassuring move for users — the idea of a choice between two operating systems on the same machine," said Wayne Kernochan, an analyst at The Yankee Group in Boston.

The Marlboro, Mass.-based vendor also introduced two high-end systems for its proprietary XA2000 Series 200 line; a new release of FTX Unix, which is based on AT&T Unix System V Release 4; and Stratus Intelligent Network Application Platform, an applications development platform that allows telecommunications companies to develop and manage intelligent network services.

The RISC-based XA/R machine, which runs at 40 million instructions per second, is slated to be available in the third quarter of this year, as are the high-end XA2000 Models 270 and 280.

Stratus also drew attention last week to its networking capabilities, underscoring a corporate direction to expand beyond its traditional role as a front-end processor in the financial and brokerage industries into markets where extensive connectivity and open systems are as important as never-fail computers.

High-growth areas

Stratus President William Foster identified insurance, travel and telecommunications as future high-growth spots for the $341 million company.

At Blue Cross/Blue Shield of Massachusetts, for example, a Stratus XA2000 Model 210 running Stratus' Network Express software serves as a gateway from 11 hospitals into the insurer's three mainframes from IBM, Amdahl Corp. and Bull HN Information Systems, Inc.

Eventually, all 140 hospitals statewide will have access through the Stratus machine in the Boston headquarters, said George P. May, director of provider automation services for Blue Cross/Blue Shield in Boston. "We're trying to be as open as we can to the hospitals so they can feel comfortable dealing with us," May said.

In addition to its new hardware, Stratus sketched out plans to develop software for the VOS and FTX operating systems, including a high-performance commercial file system and a transaction monitor for distributed on-line transaction processing.

IBM also confirmed, in a separate announcement, that it will continue to sell the Stratus boxes under the System/88 label — an arrangement that will extend to include the Stratus RISC machines as well.

Stratus' sphere

Stratus introduced two high-end systems along with its first RISC-based fault-tolerant computer

Model	XA/R 20	XA2000 270	XA2000 280
Processor type	Intel I860	Motorola 68030	Motorola 68030
Number of duplexed processors	1	7	8
Duplexed memory	32M bytes	64M bytes	64M bytes
Performance	Not available	Not available	Not available
Base price	$247,000-$275,000	$1,266,000	$1,411,000

Source: Stratus Computer, Inc.

CW Chart: Nancy Koval

Amdahl

FROM PAGE 1

because it did not appear that Amdahl was serious enough about the software, said John Meadows, the bank's senior vice president of systems architecture and development.

Looking back

However, Meadows said he would take another look now that Amdahl is preparing to officially market the software. "It was a good tool, you know. It really was," he said.

He also said the bank has installed IBM's Repository Manager, and although he supports the IBM application development strategy, it does not preclude him from looking at other vendors' offerings as well.

Analysts said the software could be positioned as an alternative to AD/Cycle, which IBM has been pushing as the industry standard for host-based application development. Initial reaction from some IBM shops contacted last week indicated that doors will at least be open for Amdahl to make its pitch.

Michael Setzejnberg, vice president of technical services at Manufacturers Hanover Trust Co., said he was unofficially informed about Huron by Amdahl "a couple of months ago." He said he would "definitely" consider it as a serious application development offering.

"From what I understand, it would be a product that is further along than AD/Cycle is today," Setzejnberg said. "It is more automated and would solve more of the steps within the development process. If it proves to be superior at this stage, most [users] would evaluate it on that basis."

Jim Cassell, a vice president at Gartner Group, Inc., said the Amdahl offering will not be a direct AD/Cycle competitor because it will take a different approach to software development.

"It doesn't do the life cycle," Cassell said. "It is rather complete, rather self-contained. You write in that environment, and it will take care of everything for you."

Aaron Zornes, a vice president at Meta Group, Inc., also likened it to a self-contained environment. "Huron will have its own database," he said. "So it's a database, repository and [fourth-generation language], and you can build applications to access data in Huron," he said.

More than meets the eye

On the surface, this move seems like an abrupt departure from the business of selling CPUs and disk drives, but industry observers said it is more a continuation of Amdahl's efforts to expand its revenue base. Earlier steps include a mainframe-based Unix operating system and a partitioning facility to logically split up a processor complex.

"I'm not surprised by this move," said Bob Djurdjevic, president of Annex Research, who said he was expecting an announcement in the "subsystems arena."

"They had another project called Aspen that was supposed to be a more efficient MVS and was canned in the mid-1980s when they started focusing on Unix. They were the first to offer [mainframe-based Unix], so they've had lots of software experience," Djurdjevic said.

AT&T corners NCR in takeover battle

BY MICHAEL FITZGERALD
CW STAFF

DAYTON, Ohio — Like a heavyweight boxer poised to finish off a bout after wearing down a smaller, though valiant, opponent, AT&T was seen last week as ready to land the final blow in its takeover effort against NCR Corp.

Widespread speculation that NCR is backed into a corner and will have to negotiate a deal with AT&T followed two unrelated events last week: a general stock market drop on news that IBM's earnings would be perhaps half of analysts' projections and a U.S. District Court decision invalidating NCR's employee stock ownership plan (ESOP). The court ruled that the ESOP had "the primary purpose of entrenching NCR's management."

Although NCR has appealed the ESOP decision, analysts said the merger is a done deal, with only price and timing to be decided. Some analysts think negotiations will begin before NCR's annual meetings on Thursday.

Offer of $100 per share

AT&T followed up the ESOP ruling by announcing that it will pay NCR shareholders $100 per share — $10 more than it offered in December — if it receives the 80% of shares it needs to oust NCR's board at the special meeting. However, some analysts speculated that AT&T's offer could grow by even more, perhaps to $110, if it is done through a stock swap.

"NCR is trying to figure out what the odds are that AT&T actually gets 80% of the vote. If that happens, NCR has no more say in anything," said Charles Neuhauser, an analyst at Legg Mason Wood Walker, Inc.

AT&T Chairman Robert Allen told an investor group last week that he thinks it is "in everyone's best interest to come to a negotiated agreement" before the meetings.

While NCR still has a poison pill defense, AT&T has challenged this as well, and the same judge who struck down the ESOP with a sharply worded opinion will rule on the poison pill's validity. Some observers said this works against NCR.

"The tone of the judge's [ESOP] ruling was really a public slap . . . at a whole series of tactics being deployed by NCR to block this [takeover]," said Harvey L. Poppel, a partner at Broadview Associates, a Fort Lee, N.J.-based specialist in information technology mergers and acquisitions.

NCR customers contacted said the struggle has had no immediate impact on them.

Unisys names Braun president, COO

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. executive Reto Braun was named president and chief operating officer of the computer and defense electronics company last week.

The promotion comes on the heels of Braun's appointment late last month to the Unisys board of directors. Braun, 49, had been executive vice president responsible for Unisys' corporate marketing and the U.S. and Pacific Asia Americas region marketing division.

His new post adds responsibility for all commercial computer marketing, product development and manufacturing operations worldwide, including the Computer Systems Product Group, corporate marketing, U.S. Information Systems and the Europe-Africa and Pacific Asia Americas divisions.

"Implementing the strategy Unisys has been hammering out over the last two to three or even four years" will be his short-term objective, Braun said. He added that the company's product introductions this year confirm "we did not cut R&D in the last two years."

Unisys' Braun moves up from VP to president and COO

Braun acknowledged that Unisys' debt ratio — $3.7 billion on a worth of $10 billion — is far too high, but he said he did not believe a partnership was necessarily the way to address the problem.

A partnership "could add to the problem or be one way to solve it," he said. Unisys has stated a goal of reducing its debt by more than $600 million this year.

Braun takes over the title of president from Chief Executive Officer James A. Unruh. Unruh, who also holds the title of chairman, will continue to be responsible for the defense systems, government systems, communications and networks group and corporate staffs.

Banyan

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New York-based Vines user The Turner Corp., said Dick Schell, director of information systems. Schell explained that one of the construction management company's major applications is an OS/2-based human resources management system from Peoplesoft, Inc. that integrates personnel, payroll, benefits tracking and other functions.

"The application is optimized for an OS/2 client with a single engine, so the OS/2 rollout is very important to us," he said.

Vines 4.1 beta-test user Mike Housley, systems technical services manager at the Arizona Public Services Co. in Phoenix, said that while bringing OS/2 into the client fold "is a major step that is consistent with the direction of my company and others, there will initially be limited application programming interface support" in the OS/2 Vines version.

Schell and Housley are two of six steering committee members of the Network Applications Consortium, a 40-company group that has taken a "power in numbers" approach to spurring the commercial development of Vines-integrated applications. As a result of its efforts, the committee recently began communicating on consortium business via a beta-test version of Lotus Development Corp.'s Notes tightly integrated with Vines 4.1.

Lotus' Notes was originally developed for OS/2 platforms and has been unable to run under Vines, which is inherently AT&T Unix System V-based. "This Vines release will allow us to put Lotus Notes services on all our OS/2 clients," said John Ryan, director of systems engineering at Compaq Computer Corp. and a consortium member.

Expanding Vines connectivity to other platforms will help keep Banyan sparring with local-area networking market leader Novell, Inc. Novell, historically work group-oriented, has recently taken steps to threaten Banyan's market share in enterprise networking by enhancing its Netware network operating system and forming a reseller partnership with IBM. Netware supports DOS, Windows, OS/2, Unix and Apple Computer, Inc.'s Macintosh clients.

AMD's 386 clone ready, but will it sell?

BY RICHARD PASTORE
CW STAFF

Intel Corp.'a days as the single source of 80386 chips will end today when Advanced Micro Devices, Inc. (AMD) unveils its 40-MHz versions of the microprocessor. At least one vendor has publicly adopted the clone chip, but a pending lawsuit and Intel's I486 product proliferation may slow acceptance of the clone, vendors and users said.

AMD's AM386DX-40 microprocessor will offer 21% better CPU performance than Intel's 33-MHz 80386, the company said. A 33-MHz 80386 machine with a 64K-byte cache will deliver about 8 million instructions per second (MIPS) performance. For about $40 more in end-user cost, a similarly configured 40-MHz AM386 box will deliver 9 MIPS, according to Chips & Technologies, Inc., which will announce a chip set to support the 80386 clone this week.

AMD's second announced processor, the AM386DXL-40, was designed for low-power consumption, making it possible for the full 32-bit chip to operate in battery-powered portable computers.

AMD claimed to have shipped 10,000 AM386 units already, some of which have gone to Northgate Computer Systems, Inc. The Minneapolis-based direct marketer demonstrated personal computers last week based on the 40-MHz chip and an as-yet-unannounced 25-MHz 80386SX clone from AMD.

Northgate Chairman Art Lazere said he adopted the AMD chips "because Intel doesn't have them." The firm did not reveal pricing or ship dates for the PCs. However, it expects to be among the first to ship AMD-based boxes. AMD has claimed that about 25 vendors are evaluating and intending to use the chips.

The wrath of Intel

The clone chips will most likely interest second-tier PC makers such as Northgate rather than top names such as IBM, said Dean McCarron, an analyst at Instat, Inc. in Scottsdale, Ariz. He said the industry's big guns are more worried about incurring the wrath of Intel and about the pending lawsuit between that company and AMD. McCarron said he expects AMD's 386 market share to reach 10% next year.

While AMD won the right in court this month to use Intel's 386 designation, Intel is also suing for infringement of its chip microcode. AMD claims it contracted to use the code in 1976. Intel could not be reached for comment.

The case goes to trial this summer, but win or lose, "we will not be forced out of the 386 market," an AMD spokesman said. He noted that end users will not be liable.

Nevertheless, some users are skittish. "I don't know that I would buy [an AMD-based] computer until that lawsuit is settled. What happens to your machine if AMD loses?" asked Bruce Greif, project analyst at County Natwest, Inc. in New York.

Others applauded the added competition for Intel. "The fact that the chip's come out is a good thing. The competition improves the industry," said Michael Purcell, manager of technology planning and information resources at Baxter Healthcare Corp.

"As long as Intel maintains a steady flow of products, there's not a real necessity fo us to make changes," said David Kirkey, vice president of marketing at Advanced Logic Research, Inc. Intel's current and future I486 products are a better alternative for the company and its customers, Kirkey said.

Not even early adopters such as Northgate have completely thrown in their lot with AMD. "We'd prefer to stay 100% with Intel down the line," Lazere said.

Multimedia standards catching on

Software, hardware developers beginning to follow Microsoft's lead

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Although compact disc/read-only memory (CD-ROM) vendors agree that multimedia is an upcoming and promising technology for institutional and business applications, they have been stymied by a lack of standards — until last week.

Evidence of change was rampant at last week's Annual Conference & Exposition on Multimedia and CD-ROM held here, as CD-ROM developers and hardware and software vendors announced their support for proposed standards and labels announced at the show.

The widespread incorporation of Microsoft Corp.'a Multimedia Extension to Windows 3.0 in CD-ROM applications was proof that Windows could ease users' burdens of dealing with incompatible search-and-retrieval CD-ROM software. A Windows front end will eliminate the need to install weighty software on hard drives to access the data on different CD-ROM products using the Multimedia Extension.

"I think it makes sense to use Windows as a front end to CD-ROM applications," said show attendee John Newton, director of the Development Software Products Division at Xerox Corp. in Palo Alto, Calif.

Show attendee Sandra Scott reiterated Newton's support for Windows, adding that until now, users have been forced to learn a separate search-and-retrieval method for each CD-ROM application.

"Standards are an issue for us because our customers are looking for a direction" in which CD-ROM is headed, said Scott, manager of product acquisition at Soft-Kat, a CD-ROM distributor in Chatsworth, Calif., and a division of W. R. Grace & Co.

However, while Windows will help the CD-ROM and multimedia markets, Windows as a front-end search-and-retrieval system for CD-ROM applications is not a cure-all solution because it excludes both the Unix and Apple Computer, Inc. Macintosh markets, Scott said.

Andrew Young, founder and president of Young Minds, Inc. in Redlands, Calif., said his company is one of several Unix vendors trying to solve that problem on the Unix front.

Last week, the Rock Ridge Group, a Unix consortium, proposed a CD-ROM standard to the National Institute of Standards and Technology called the Rock Ridge Interchange Protocol. The proposed standard was designed to allow multiple file system extensions to coexist on the same CD-ROM disc, meaning that CD-ROMs could be read across multiple platforms, the group said.

Standards for CD-ROM, however, are not the only issues. Although multimedia is being incorporated into CD-ROM applications, vendors are also building multimedia systems, CD-ROM drives and other peripherals for the emerging multimedia market. And they are not all compatible.

Although the problem is far from being resolved, Microsoft announced last week that it has initiated a multimedia version of a *Good Housekeeping* seal of approval. The Multimedia PC, or MPC, label will be applied to IBM Personal Computer and compatible DOS-based systems that meet the basic Microsoft-made multimedia specifications introduced last November. So far, 12 companies have endorsed it, but IBM is not one of them (see story below).

Critical mass?

The approximate doubling each year of installed CD-ROM drives and commercial and in-house applications may be bringing vendor offerings closer to user needs

	Total number of titles (includes commercial and in-house)	Installed CD-ROM drives worldwide
[illegible]	[illegible]	[illegible]
1987	260	32,500
[illegible]	[illegible]	[illegible]
1989	1,418	545,000
[illegible]	[illegible]	[illegible]
1991*	5,916	2.9M
[illegible]	[illegible]	[illegible]

*Projected

Source: Infotech

CW Chart: Tom Monahan

Microsoft's MPC label not officially supported by IBM

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Microsoft Corp.'a distinctive IBM Personal Computer and compatible flavor of its new MPC consumer label is, ironically, not officially supported by IBM.

While several companies — including Tandy Corp., Zenith Data Systems, Fujitsu Ltd. and Philips Home Electronics, Inc., among several other hardware and software vendors — went along with last week's unveiling of the MPC label, IBM kept quiet.

"We are not one of the companies that formerly announced support for the MPC label because ... we just don't feel a need to support that certain configuration," an IBM spokesman said last week.

However, if Microsoft were to turn the label over to an independent organization, "there would be no reason why we wouldn't support it since we support the idea behind it," the spokesman added.

According to Microsoft's Rob Glaser, general manager of the Multimedia Systems Group, Microsoft has every intention of offering the label to an independent organization, but it has not decided which trade group it will offer the label to at this time.

Some industry experts speculated that Microsoft would do well in offering the label to the Washington, D.C.-based Interactive Multimedia Association (IMA).

Microsoft, which joined the independent manufacturer's trade group as a sponsor last week, said it has to review all of its options before it makes a decision. Apple Computer, Inc. and IBM also belong to the IMA, which has a membership of 169 companies so far.

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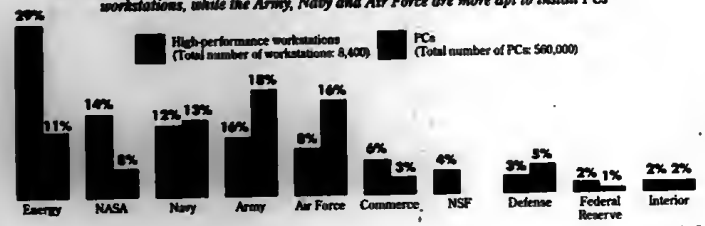
TRENDS

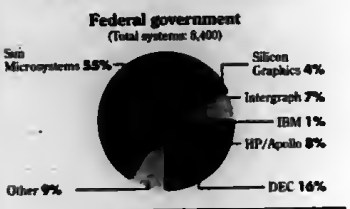
FEDERAL GOVERNMENT COMPUTING

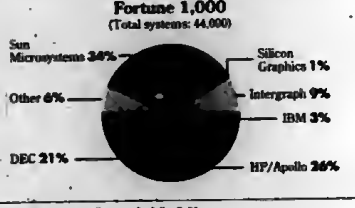
While the federal government presents a large market for high-performance workstations and personal computers, only a handful of vendors control a significant portion of the market

Computer use by U.S. federal agencies
(Percent of installed systems)
Emphasis on research requires the Department of Energy to depend heavily on high-powered workstations, while the Army, Navy and Air Force are more apt to install PCs

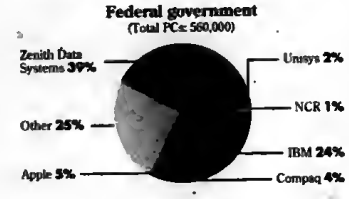


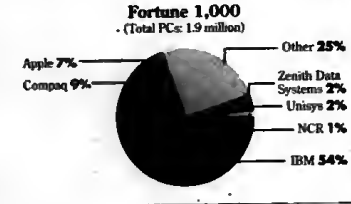
High-performance workstations
(Percent of market share by installations)
Sun Microsystems is even more dominant in federal agencies than in large companies





PCs
(Percent of market share by installations)
Zenith Data Systems and IBM struggle to be the leading PC supplier to the federal government





Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Well-integrated local-area networks offer unparalleled opportunities — and headaches. **Integration Strategies** looks at how savvy IS managers like Ted Furtch at Crucible Service Centers have successfully woven LANs into their overall computing strategies. Plus, a look at the pros and cons of the different ways to integrate LANs.

Bob Mahoney

The idea behind IS self-directed work groups is to push management decision-making out to staff members. This increased responsibility, in turn, empowers IS individuals to do their jobs better and faster and eliminates the need for several layers of management. But this way of organizing is not a quick fix: It takes time, money and companywide buy-in.

INSIDE LINES

Editor's note: Last week in this space, *Computerworld* ran a series of anonymous quotes ("juicy stuff . . . we can't attribute") relating to the relationship between Microsoft and its third-party software developers. In doing so, we unintentionally violated some of our own guidelines governing balance and right of rebuttal. Some of the quotes included unsubstantiated charges and items of a personal nature that should not have been published anonymously. Furthermore, Microsoft should have been given the opportunity to respond to the remarks.

Computerworld may also have inappropriately implied that the quotes represented the sentiment of the third-party software community as a whole toward Microsoft and its management. We have no evidence that this is the case. Finally, because of an editing error, the four anonymous quotes were portrayed as coming from several sources when in fact one source was responsible for three of them. *Computerworld* regrets these errors and apologizes for any hardship they may have caused.

Late, but still early

NCR's Bill Eisenman, vice president of multiuser products, confirmed recently that some pieces of the company's System 3000 series are behind schedule. The 3450 and 3550 machines, including multiprocessor and dual-bus architecture versions, are about 30 days behind schedule but are on course for third-quarter delivery, ahead of the fourth-quarter shipment schedule NCR has promised its customers, Eisenman said. He said the firm had orders in hand for the systems from around the world but would not disclose volume or numbers.

They just don't get it

Is this why IBM stock plummeted? In an architectural design show last week, computer-aided design (CAD) software whizzed by on high-end PCs and RISC workstations. The loneliest exhibitors were the guys behind the IBM AS/400 booth. Nowhere to be found was IBM's RISC System/6000 — the logical choice for CAD graphics in the firm's line.

Windows' future not so far off

The arrival of Microsoft's Windows-32 next-generation graphical user interface may still be a year or more off, but Software Development Kits will be shipped to more than 100 developers by year's end, a Microsoft insider says. Specifications for employing Microsoft's object-linking and embedding strategy in the Macintosh environment are also slated to ship this year.

Beam me up, Scotty?

AT&T is telling analysts and potential buyers that its new SX notebook will be more than a "me-too" product. Although the specifications sound ordinary — 1½-in. thick, under seven pounds, 20-MHz processor, 20M-, 40M- and 60M-byte hard drive options, 2,400 bit/sec. internal modem and 10-in. IBM Video Graphics Array screen — the photo of an AT&T salesman in last week's *Business Week* showed what AT&T confirmed was a prototype of its new notebook with speaker-like grates and knobs above the keyboard. The firm wouldn't comment on those features, but we'll find out on or around April 15.

Let's get together

Sybase Corp. is expected to announce today that it is acquiring a small CASE company, which will broaden the privately held RDBMS firm's product line. Industry sources say they believe the firm is Rendale, Ontario-based Deft, which has sales of about $4 million per year. Sybase's sales are believed to be in excess of $100 million. Deft is known for its reverse-engineering tools and for its gateways to multiple RDBMS products. Sybase declined to comment on Deft.

Will D&B Software hold all of its announcements in Atlanta during the gridiron season after John P. Imlay Jr. acquires 6% of minority stock in the Atlanta Falcons? What better place to hash over lofty software issues than in a skybox? Although Imlay's reported $6 million purchase is for nonvoting stock, he was also guaranteed the right of first refusal on future stock sales. Inside tips on the Falcons' chances should be called in to News Editor Pete Bartolik at (800) 343-6474 or faxed to 508-875-8931.

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